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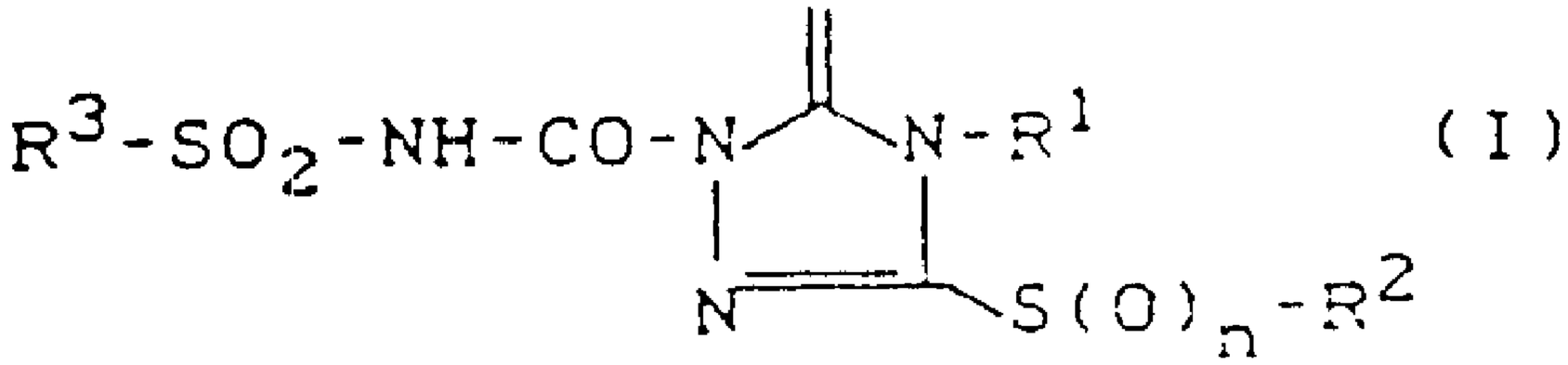
(72) Inventeurs/Inventors:
Schmidt, Robert R., DE;
Santel, Hans-Joachim, DE;
Babczinski, Peter, DE;
Müller, Klaus-Helmut, DE

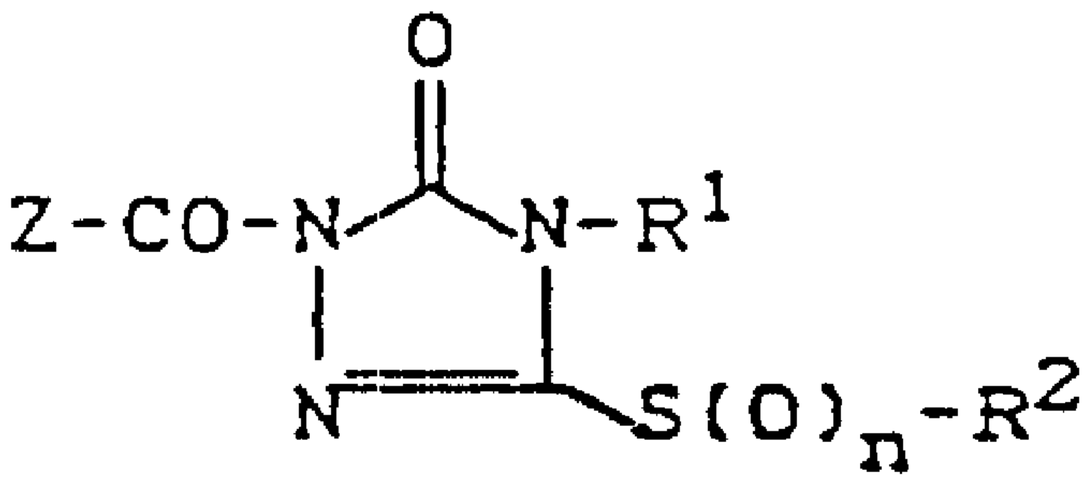
(73) Propriétaire/Owner:
BAYER AKTIENGESELLSCHAFT, DE

(74) Agent: FETHERSTONHAUGH & CO.

(54) Titre : SULPHONYLAMINOCARBONYLTRIAZOLINONES A SUBSTITUANTS LIES PAR LE SOUFRE
(54) Title: SULPHONYLAMINOCARBONYLTRIAZOLINONES HAVING SUBSTITUENTS WHICH ARE BONDED VIA SULPHUR



(I)



(IV)

(57) Abrégé/Abstract:
Herbicidal sulphonylaminocarbonyl-triazolinones having substituents which are bonded via sulphur, of the formula (see formula I) in which n represents the numbers 0, 1 or 2, R^1 represents hydrogen, hydroxyl or amino, or represents an optionally substituted radical from the series comprising alkyl, alkenyl, alkinyl, cycloalkyl, aralkyl, aryl, alkoxy, alkenyloxy, alkylamino, cycloalkylamino and dialkylamino, R^2 represents an optionally substituted radical from the series comprising alkyl, alkenyl, alkinyl, cycloalkyl, cycloalkenyl, aralkyl and aryl, and R^3 represents an optionally substituted radical from the series comprising alkyl, aralkyl, aryl and heteroaryl, as well as salts of compounds for the formula (I). Also new are the compounds for the following formula: (see formula IV) in which N, R^1 and R^2 have the abovementioned meanings and Z represents halogen, alkoxy, aralkoxy or aryloxy.

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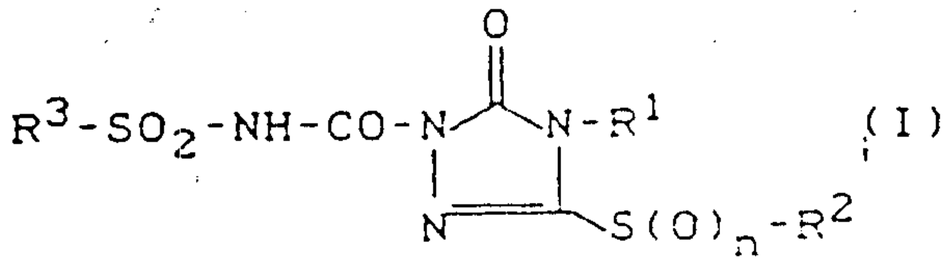
ABSTRACT

Herbicidal sulphonylaminocarbonyl-triazolinones having substituents which are bonded via sulphur, of the formula



(I)

in which

n represents the numbers 0, 1 or 2,

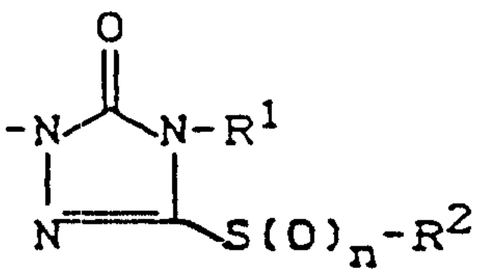
R^1 represents hydrogen, hydroxyl or amino, or represents an optionally substituted radical from the series comprising alkyl, alkenyl, alkinyl, cycloalkyl, aralkyl, aryl, alkoxy, alkenyloxy, alkylamino, cycloalkylamino and dialkylamino,

R^2 represents an optionally substituted radical from the series comprising alkyl, alkenyl, alkinyl, cycloalkyl, cycloalkenyl, aralkyl and aryl, and

R^3 represents an optionally substituted radical from the series comprising alkyl, aralkyl, aryl and heteroaryl,

as well as salts of compounds for the formula (I).

Also new are the compounds for the following formula:



(IV)

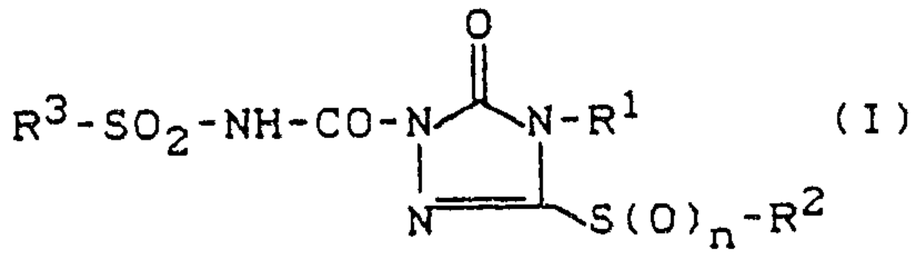
in which

N, R^1 and R^2 have the abovementioned meanings and Z represents halogen, alkoxy, aralkoxy or aryloxy.

The invention relates to new sulphonylamino-carbonyltriazolinones having substituents which are bonded via sulphur, to a variety of processes for their preparation, and to their use as herbicides.

It is known that certain substituted amino-carbonylimidazolinones, such as, for example, 1-isobutyl-aminocarbonyl-2-imidazolidinone (isocarbamid), have herbicidal properties (cf. R. Wegler, Chemie der Pflanzenschutz-und und Schädlingsbekämpfungsmittel [Chemistry of Plant Protection Agents and Pesticides], Volume 5, p. 219, Springer-Verlag, Berlin-Heidelberg-New York, 1977). However, the action of this compound is not satisfactory in all respects.

The new sulphonylaminocarbonyl-triazolinones having substituents which are bonded via sulphur, of the formula (I)



(I)

in which

n represents the numbers 0, 1 or 2,

R^1 represents hydrogen, hydroxyl or amino, or represents an optionally substituted radical from the series comprising alkyl, alkenyl, alkinyl, cycloalkyl, aralkyl, aryl, alkoxy, alkenyloxy, alkyl-

amino, cycloalkylamino and dialkylamino,

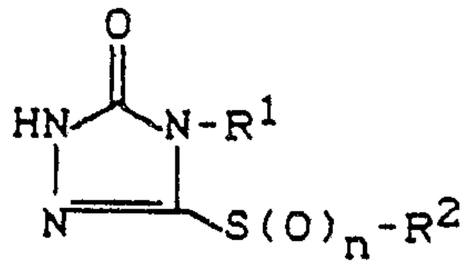
R^2 represents an optionally substituted radical from the series comprising alkyl, alkenyl, alkinyl, cycloalkyl, cycloalkenyl, aralkyl and aryl, and

R^3 represents an optionally substituted radical from the series comprising alkyl, aralkyl, aryl and heteroaryl,

as well as salts of compounds of the formula (I), have now been found.

The new sulphonylaminocarbonyltriazolinones having substituents which are bonded via sulphur, of the general formula (I), are obtained when

a) triazolinones of the general formula (II)



(II)

in which

n, R^1 and R^2 have the abovementioned meanings,

are reacted with sulphonyl isocyanates of the general formula (III)

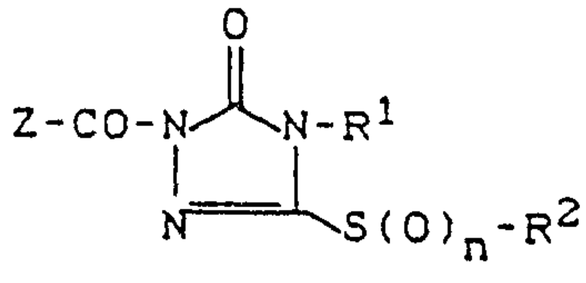
$$R^3\text{-}SO_2\text{-}N{=}C{=}O \qquad \text{(III)}$$

in which

R^3 has the abovementioned meaning,

if appropriate in the presence of a diluent, or when

b) triazolinone derivatives of the general formula (IV)



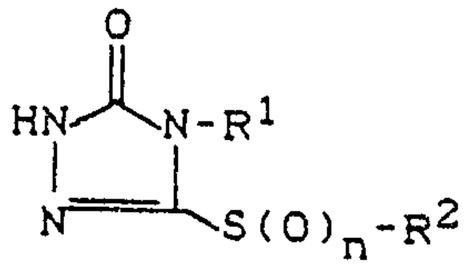
(IV)

in which
n, R^1 and R^2 have the abovementioned meanings and
Z represents halogen, alkoxy, aralkoxy or aryloxy,
are reacted with sulphonamides of the general formula (V)

$$R^3\text{-}SO_2\text{-}NH_2 \qquad (V)$$

in which
R^3 has the abovementioned meaning,
if appropriate in the presence of an acid acceptor and if appropriate in the presence of a diluent, or when

c) triazolinones of the general formula (II)



(II)

in which
n, R^1 and R^2 have the abovementioned meanings,
are reacted with sulphonamide derivatives of the

general formula (VI)

$$R^3\text{-}SO_2\text{-}NH\text{-}CO\text{-}Z \qquad (VI)$$

in which

R^3 has the abovementioned meaning and

Z represents halogen, alkoxy, aralkoxy or aryloxy, if appropriate in the presence of an acid acceptor and if appropriate in the presence of a diluent, and, if desired, salts are formed by customary methods from the compounds of the formula (I) prepared by process (a), (b) or (c).

The new sulphonylaminocarbonyltriazolinones having substituents which are bonded via sulphur, of the general formula (I), and their salts are distinguished by a powerful herbicidal activity.

Surprisingly, the new compounds of the formula (I) have a considerably better herbicidal action than the herbicide 1-isobutylaminocarbonyl-2-imidazolidinone (isocarbamid), which is known and has a similar structure.

The invention preferably relates to compounds of the formula (I) in which

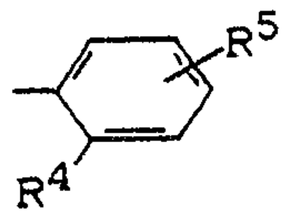
n represents the numbers 0, 1 or 2,

R^1 represents hydrogen, hydroxyl or amino, or represents C_1-C_6-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1-C_4-alkoxy, C_1-C_4-alkylcarbonyl or C_1-C_4-alkoxy-carbonyl, or represents C_3-C_6-alkenyl or C_3-C_6-alkinyl, each of which is optionally substituted by fluorine, chlor-

ine and/or bromine, or represents C_3-C_6-cycloalkyl which is optionally substituted by fluorine, chlorine, bromine and/or C_1-C_4-alkyl, or represents phenyl-C_1-C_3-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1-C_4-alkyl, trifluoromethyl, C_1-C_4-alkoxy and/or C_1-C_4-alkoxy-carbonyl, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1-C_4-alkyl, trifluoromethyl, C_1-C_4-alkoxy, fluorine- and/or chlorine-substituted C_1-C_3-alkoxy, C_1-C_4-alkylthio, fluorine- and/or chlorine-substituted C_1-C_3-alkylthio, C_1-C_4-alkylsulphinyl, C_1-C_4-alkylsulphonyl and/or C_1-C_4-alkoxy-carbonyl, or represents C_1-C_6-alkoxy which is optionally substituted by fluorine, chlorine, cyano, phenyl, C_1-C_4-alkoxy or C_1-C_4-alkoxy-carbonyl, or represents C_3-C_4-alkenyloxy, or represents C_1-C_4-alkylamino which is optionally substituted by fluorine, cyano, C_1-C_4-alkoxy or C_1-C_4-alkoxy-carbonyl, or represents C_3-C_6-cycloalkylamino or di-(C_1-C_4-alkyl)-amino,

R^2 represents C_1-C_6-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy or C_1-C_4-alkoxycarbonyl, or represents C_3-C_6-alkenyl or C_3-C_6-alkinyl, each of which is optionally substituted by fluorine, chlorine and/or bromine, or represents C_3-C_6-cycloalkyl which is optionally substituted by fluorine, chlorine, bromine and/or C_1-C_4-alkyl, or represents cyclohexenyl, or represents phenyl-C_1-C_3-alkyl which

is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1-C_4-alkyl, trifluoromethyl, C_1-C_4-alkoxy and/or C_1-C_4-alkoxycarbonyl, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1-C_4-alkyl, trifluoromethyl, C_1-C_4-alkoxy, fluorine- and/or chlorine-substituted C_1-C_3-alkoxy, C_1-C_4-alkylthio, fluorine- and/or chlorine-substituted C_1-C_3-alkylthio, C_1-C_4-alkyl-sulphinyl, C_1-C_4-alkyl-sulphonyl and/or C_1-C_4-alkoxy-carbonyl, and

R^3 represents the group  where

R^4 and R^5 are identical or different and represent hydrogen, fluorine, chlorine, bromine, iodine, nitro, C_1-C_6-alkyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1-C_4-alkoxycarbonyl, C_1-C_4-alkylamino-carbonyl, di-(C_1-C_4-alkyl)amino-carbonyl, hydroxyl, C_1-C_4-alkoxy, formyloxy, C_1-C_4-alkyl-carbonyloxy, C_1-C_4-alkoxy-carbonyloxy, C_1-C_4-alkylamino-carbonyloxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl, C_1-C_4-alkylsulphonyl, di-(C_1-C_4-alkyl)-aminosulphonyl, C_3-C_6-cycloalkyl or phenyl), or represent C_2-C_6-alkenyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1-C_4-alkoxy-carbonyl, carboxyl or phenyl), or represent C_2-C_6-alkinyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1-C_4-alkoxy-carbonyl, carboxyl or phenyl), or represent

C_1-C_4-alkoxy (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1-C_4-alkoxy-carbonyl, C_1-C_4-alkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl or C_1-C_4-alkylsulphonyl), or represent C_1-C_4-alkylthio (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1-C_4-alkoxy-carbonyl, C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl or C_1-C_4-alkylsulphonyl), or represent C_3-C_6-alkenyl-oxy (which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1-C_4-alkoxy-carbonyl), or represent C_2-C_6-alkenylthio (which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1-C_3-alkylthio or C_1-C_4-alkoxycarbonyl), C_3-C_6-alkinyloxy or C_3-C_6-alkinylthio, or represent the radical $-S(O)_p-R^6$ where

p represents the numbers 1 or 2 and

R^6 represents C_1-C_4-alkyl (which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1-C_4-alkoxy-carbonyl), C_3-C_6-alkenyl, C_3-C_6-alkinyl, C_1-C_4-alkoxy, C_1-C_4-alkoxy-C_1-C_4-alkylamino, C_1-C_4-alkylamino, di-(C_1-C_4-alkyl)-amino or phenyl, or represents the radical $-NHOR^7$ where

R^7 represents C_1-C_{12}-alkyl (which is optionally substituted by fluorine, chlorine, cyano, C_1-C_4-alkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl, C_1-C_4-alkylsulphonyl, C_1-C_4-alkyl-carbonyl, C_1-C_4-alkoxycarbonyl, C_1-C_4-alkyl-amino-carbonyl or di-(C_1-C_4-alkyl)-amino-carbonyl), or represents C_3-C_6-alkenyl (which

is optionally substituted by fluorine, chlorine or bromine), C_3-C_6-alkinyl, C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyl-C_1-C_2-alkyl, phenyl-C_1-C_2-alkyl (which is optionally substituted by fluorine, chlorine, nitro, cyano, C_1-C_4-alkyl, C_1-C_4-alkoxy or C_1-C_4-alkoxy-carbonyl), or represents benzhydryl, or represents phenyl (which is optionally substituted by fluorine, chlorine, nitro, cyano, C_1-C_4-alkyl, trifluoromethyl, C_1-C_4-alkoxy, C_1-C_2-fluoroalkoxy, C_1-C_4-alkylthio, trifluoromethylthio or C_1-C_4-alkoxycarbonyl),

R^4 and/or R^5 furthermore represent phenyl or phenoxy, or represent C_1-C_4-alkylcarbonylamino, C_1-C_4-alkoxycarbonylamino, C_1-C_4-alkylamino-carbonyl-amino or di-(C_1-C_4-alkyl)-amino-carbonylamino, or represent the radical -CO-R^8 where

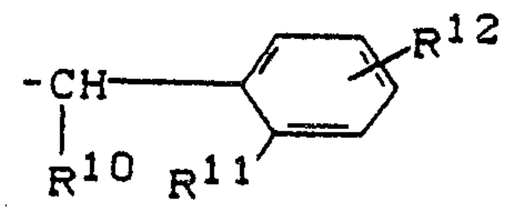
R^8 represents C_1-C_6-alkyl, C_1-C_6-alkoxy, C_3-C_6-cycloalkoxy, C_3-C_6-alkenyloxy, C_1-C_4 alkylthio, C_1-C_4-alkylamino, C_1-C_4-alkoxyamino, C_1-C_4-alkoxy-C_1-C_4-alkyl-amino or di-(C_1-C_4-alkyl)-amino (each of which is optionally substituted by fluorine and/or chlorine),

R^4 and/or R^5 furthermore represent trimethylsilyl, thiazolinyl, C_1-C_4-alkylsulphonyloxy or di-(C_1-C_4-alkyl)-aminosulphonylamino, or represent the radical -CH=N-R^9 where

R^9 represents C_1-C_6-alkyl which is optionally substituted by fluorine, chlorine, cyano, carboxyl, C_1-C_4-alkoxy, C_1-C_4-alkylthio, C_1-C_4-

alkylsulphinyl or C_1-C_4-alkylsulphonyl, or represents benzyl which is optionally substituted by fluorine or chlorine, or represents C_3-C_6-alkenyl or C_3-C_6-alkinyl, each of which is optionally substituted by fluorine or chlorine, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, C_1-C_4-alkyl, C_1-C_4-alkoxy, trifluoromethyl, trifluoromethoxy or trifluoromethylthio, or represents C_1-C_6-alkoxy, C_3-C_6-alkenoxy, C_3-C_6-alkinoxy or benzyloxy, each of which is optionally substituted by fluorine and/or chlorine, or represents amino, C_1-C_4-alkylamino, di-(C_1-C_4-alkyl)-amino, phenylamino, C_1-C_4-alkyl-carbonyl-amino, C_1-C_4-alkoxy-carbonylamino or C_1-C_4-alkyl-sulphonylamino, or represents phenylsulphonylamino which is optionally substituted by fluorine, chlorine, bromine or methyl,

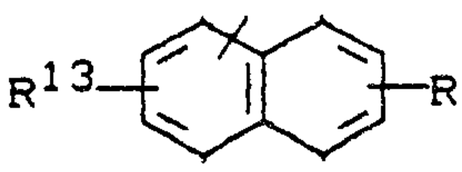
furthermore

R^3 represents the radical  where

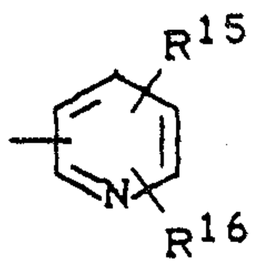
R^{10} represents hydrogen or C_1-C_4-alkyl,

R^{11} and R^{12} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1-C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1-C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), carboxyl, C_1-C_4-alkoxy-carbonyl,

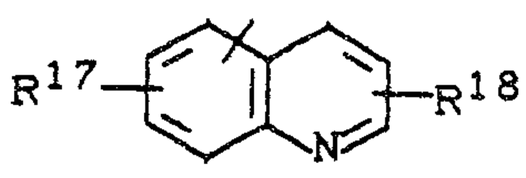
dimethylaminocarbonyl, C_1-C_4-alkylsulphonyl or di-(C_1-C_4-alkyl)-aminosulphonyl; furthermore

R^3 represents the radical  where

R^{13} and R^{14} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1-C_4-alkyl (which is optionally substituted by fluorine and/or chlorine) or C_1-C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine); furthermore

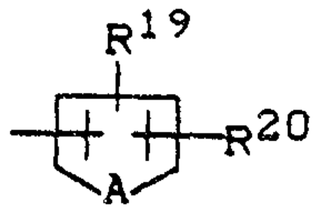
R^3 represents the radical  where

R^{15} and R^{16} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1-C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1-C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), or represents C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl or C_1-C_4-alkylsulphonyl (each of which is optionally substituted by fluorine and/or chlorine), or represents aminosulphonyl, mono-(C_1-C_4-alkyl)-aminosulphonyl, or represents di-(C_1-C_4-alkyl)-aminosulphonyl or C_1-C_4-alkoxycarbonyl or dimethylaminocarbonyl; furthermore

R^3 represents the radical  where

R^{17} and R^{18} are identical or different and represent hydrogen, fluorine, chlorine, bromine, C_1-C_4-alkyl (which is optionally substituted by fluorine and/or bromine), C_1-C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), or represent C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl or C_1-C_4-alkylsulphonyl (which is optionally substituted by fluorine and/or chlorine), or represent di-(C_1-C_4-alkyl)-aminosulphonyl;

furthermore

R^3 represents the radical  where

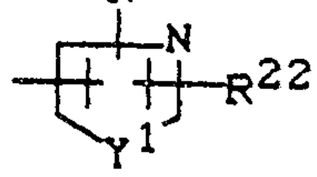
R^{19} and R^{20} are identical or different and represent hydrogen, fluorine, chlorine, bromine, cyano, nitro, C_1-C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1-C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl or C_1-C_4-alkylsulphonyl (which is optionally substituted by fluorine and/or chlorine), di-(C_1-C_4-alkyl)-amino-sulphonyl, C_1-C_4-alkoxy-carbonyl or dimethylaminocarbonyl, and

A represents oxygen, sulphur or the group N-Z^1 where

Z^1 represents hydrogen, C_1-C_4-alkyl (which is optionally substituted by fluorine, chlorine, bromine or cyano), C_3-C_6-cycloalkyl, benzyl, phenyl (which is optionally substituted by

fluorine, chlorine, bromine or nitro), C_1-C_4-alkylcarbonyl, C_1-C_4-alkoxy-carbonyl or di-(C_1-C_4-alkyl)-aminocarbonyl;

furthermore

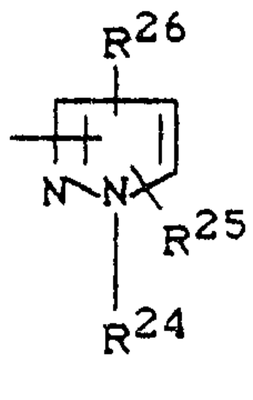
R^3 represents the radical  where

R^{21} and R^{22} are identical or different and represent hydrogen, C_1-C_4-alkyl, halogen, C_1-C_4-alkoxycarbonyl, C_1-C_4-alkoxy or C_1-C_4-halogenoalkoxy,

Y^1 represents sulphur or the group N-R^{23} where

R^{23} represents hydrogen or C_1-C_4-alkyl;

furthermore

R^3 represents the radical  where

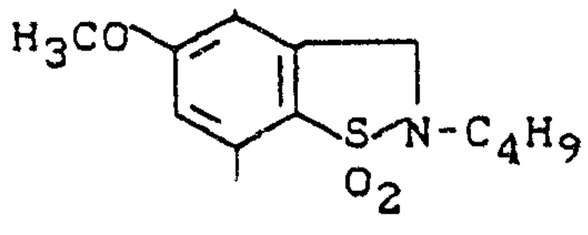
R^{24} represents hydrogen, C_1-C_4-alkyl, benzyl, pyridyl, quinolinyl or phenyl,

R^{25} represents hydrogen, halogen, cyano, nitro, C_1-C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1-C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), dioxolanyl or C_1-C_4-alkoxy-carbonyl and

R^{26} represents hydrogen, halogen or C_1-C_4-alkyl;

furthermore

R^3 represents one of the groups listed below,



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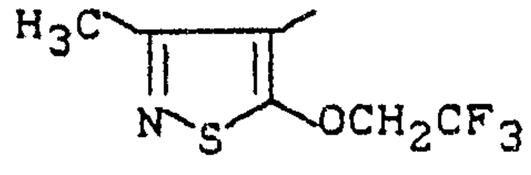
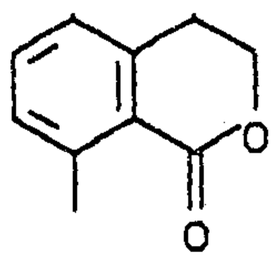




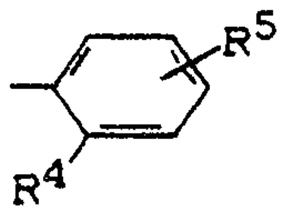
The invention furthermore preferably relates to sodium salts, potassium salts, magnesium salts, calcium salts, ammonium salts, C_1-C_4-alkyl-ammonium salts, di-(C_1-C_4-alkyl)-ammonium salts, tri-(C_1-C_4-alkyl)-ammonium salts, C_5- or C_6-cycloalkyl-ammonium salts and di-(C_1-C_2-alkyl)-benzyl-ammonium salts of compounds of the formula (I) in which n, R^1, R^2 and R^3 have the meanings indicated above as being preferred.

In particular, the invention relates to compounds of the formula (I) in which

n represents the numbers 0, 1 or 2,

R^1 represents hydrogen or amino, or represents C_1-C_4-alkyl which is optionally substituted by fluorine, cyano, methoxy or ethoxy, or represents allyl, or represents C_3-C_6-cycloalkyl, or represents benzyl, or represents phenyl, or represents C_1-C_4-alkoxy, or represents C_3-C_4-alkenyloxy, or represents C_1-C_3-alkylamino, C_3-C_6-cycloalkylamino, or represents di-(C_1-C_3-alkyl)-amino,

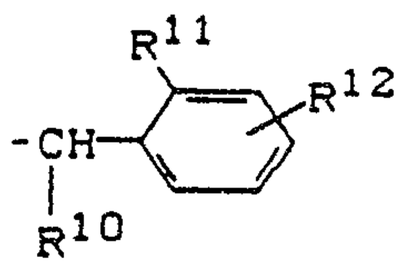
R^2 represents hydrogen, or represents C_1-C_4-alkyl which is optionally substituted by fluorine and/or chlorine, methoxy or ethoxy, or represents C_3-C_4-alkenyl which is optionally substituted by fluorine and/or chlorine, or represents C_3-C_6-cycloalkyl, or represents benzyl which is optionally substituted by fluorine, chlorine and/or methyl, and

R^3 represents the group  where

R^4 represents fluorine, chlorine, bromine, methyl, trifluoromethyl, methoxy, difluoromethoxy, trifluoromethoxy, 2-chloro-ethoxy, 2-methoxy-ethoxy, C_1-C_3-alkylthio, C_1-C_3-alkylsulphinyl, C_1-C_3-alkylsulphonyl, dimethylaminosulphonyl, diethylaminosulphonyl, N-methoxy-N-methylamino-sulphonyl, methoxyaminosulphonyl, phenyl, phenoxy or C_1-C_3-alkoxy-carbonyl, and

R^5 represents hydrogen, fluorine, chlorine or bromine;

furthermore

R^3 represents the radical  where

R^{10} represents hydrogen,

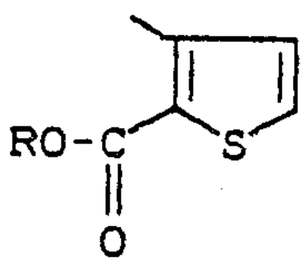
R^{11} represents fluorine, chlorine, bromine, methyl,

methoxy, difluoromethoxy, trifluoromethoxy, ethoxy, methoxycarbonyl, ethoxycarbonyl, methylsulphonyl or dimethylaminosulphonyl, and

R^{12} represents hydrogen;

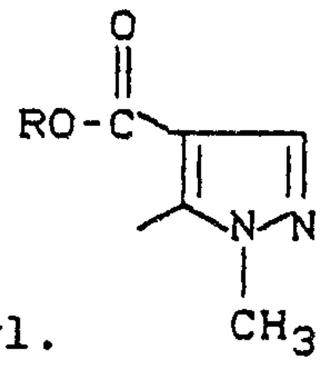
furthermore

R^3 represents the radical



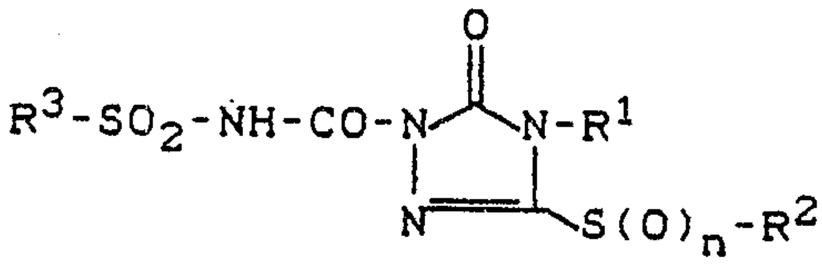
where R represents C_1-C_4-alkyl, or

represents the radical



where R represents C_1-C_4-alkyl.

Examples of the compounds according to the invention are listed in Table 1 below - cf. also the Preparation Examples.



(I)

Table 1: Examples of the compounds of the formula (I)

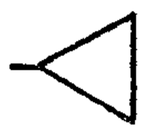
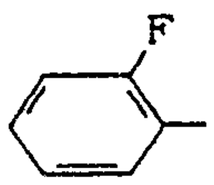
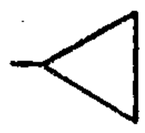
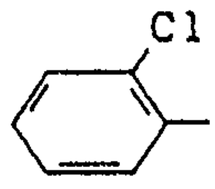
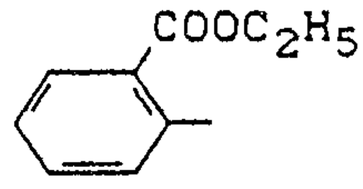
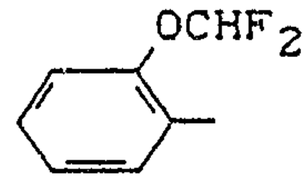
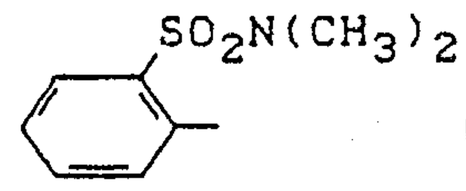
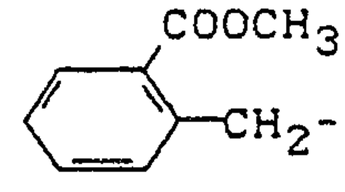
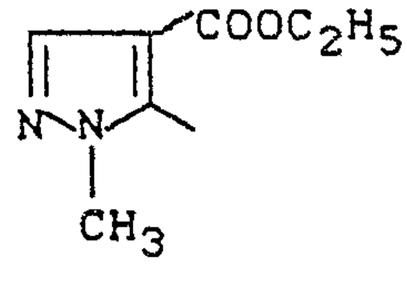
R^1	R^2	R^3	n
	CH_3		0
	CH_3		0
CH_3	C_2H_5		0
CH_3	CH_2-CH=CH_2		0
CH_3	CH_3		0
CH_3	CH_3		0
CH_3	C_2H_5		0

Table 1: (Continuation)

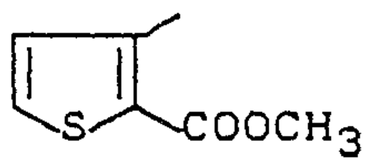
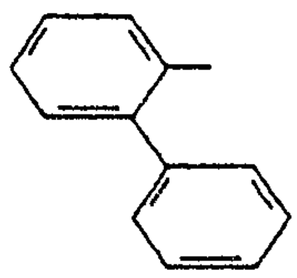
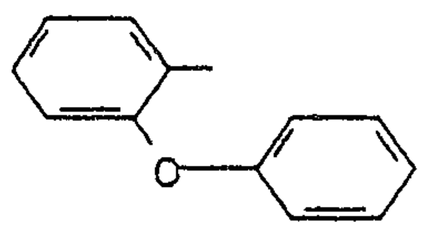
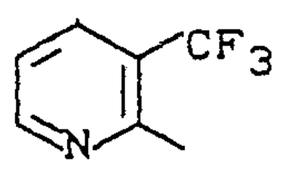
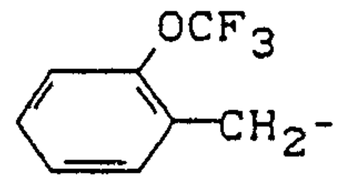
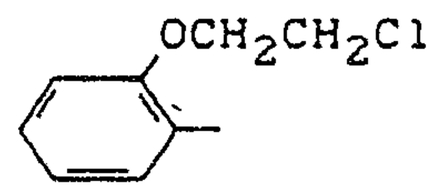
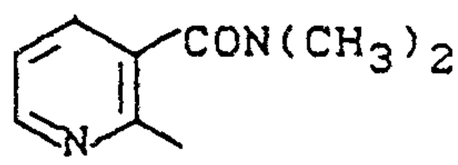
R^1	R^2	R^3	n
CH_3	C_2H_5		0
CH_3	C_2H_5		0
C_2H_5	C_2H_5		0
C_2H_5	C_3H_7		0
	CH_3		0
	C_2H_5		0
	$CH(CH_3)_2$		0

Table 1: (Continuation)

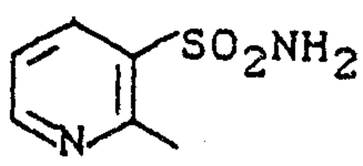
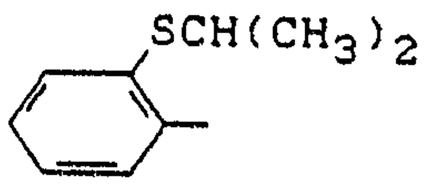
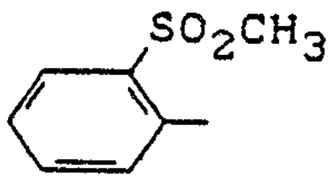
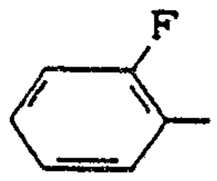
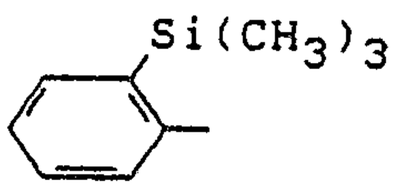
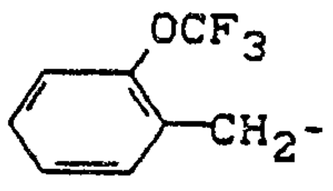
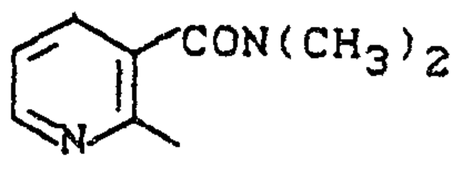
R^1	R^2	R^3	n
CH_3	$CH(CH_3)_2$		0
CH_3	$CH_2-CH=CH_2$		1
C_2H_5	CH_3		2
C_2H_5	C_2H_5		0
CH_3	C_2H_5		0
C_2H_5	C_3H_7		0
CH_3	C_2H_5		0

Table 1: (Continuation)

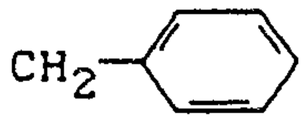
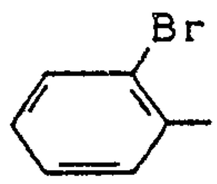
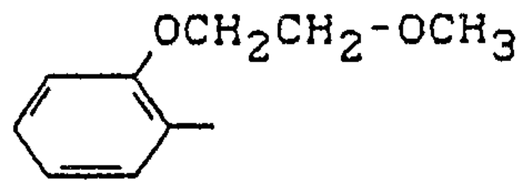
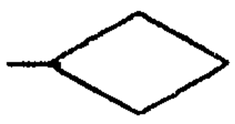
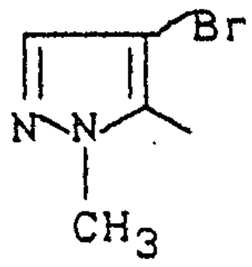
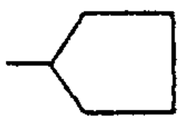
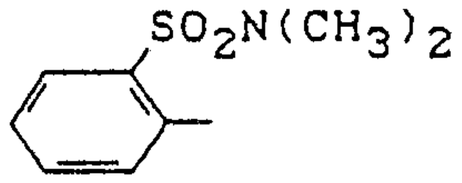
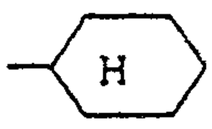
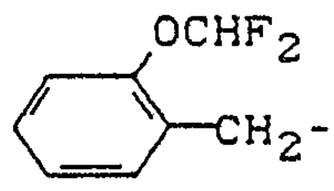
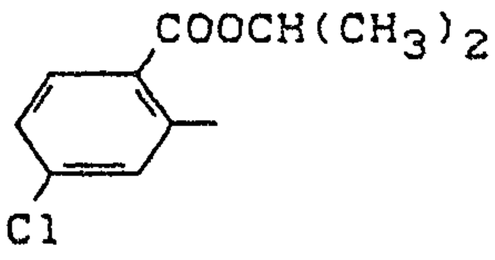
R^1	R^2	R^3	n
	CH_3		0
	C_2H_5		0
	CH_3		0
	C_2H_5		0
	C_3H_7-n		0
CH_3	C_2H_5		0

Table 1: (Continuation)

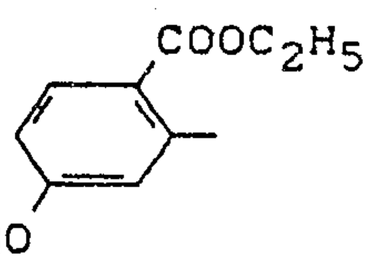
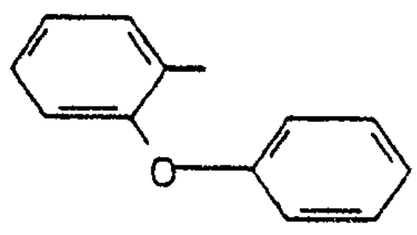
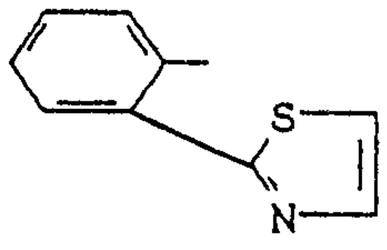
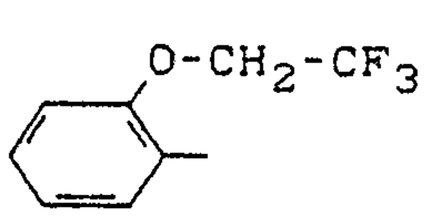
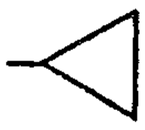
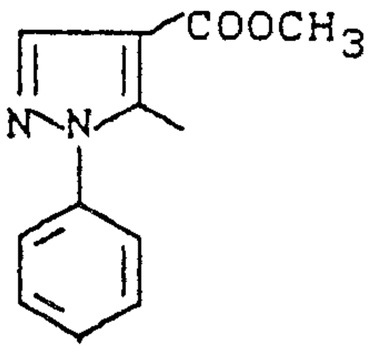
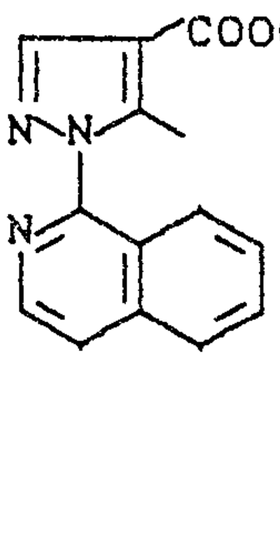
R^1	R^2	R^3	n
CH_3	CH_3		0
CH_3	C_2H_5		0
CH_3	$-CH_2-C\equiv CH$		0
CH_3	C_2H_5		0
	C_2H_5		0
	CH_3		0

Table 1: (Continuation)

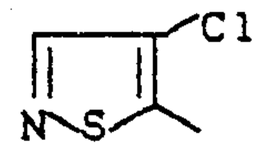
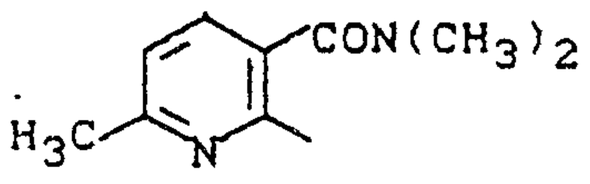
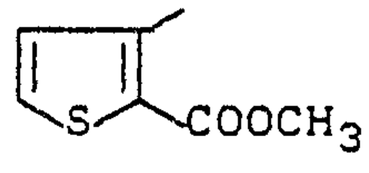
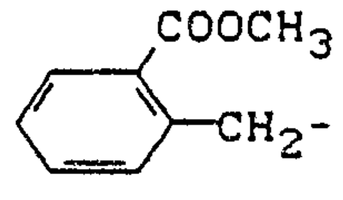
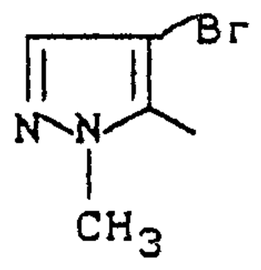
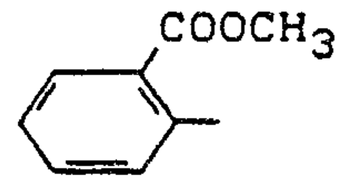
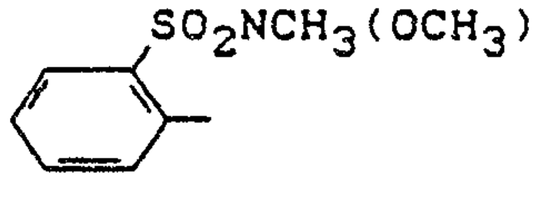
R^1	R^2	R^3	n
CH_3	CH_3		0
CH_3	C_3H_7		0
C_2H_5	C_2H_5		0
CH_2-CH=CH_2	C_2H_5		0
CH_2-CH=CH_2	CH_3		0
OCH_3	CH_3		0
OC_2H_5	C_2H_5		0

Table 1: (Continuation)

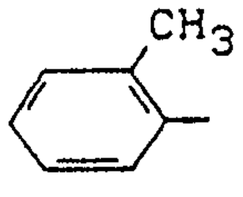
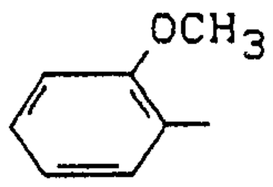
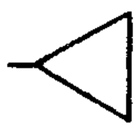
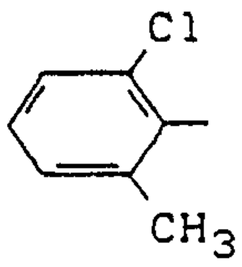
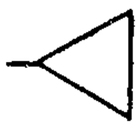
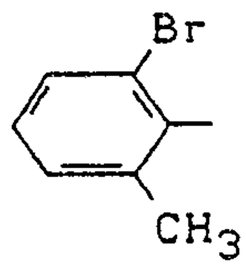
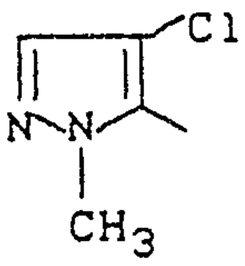
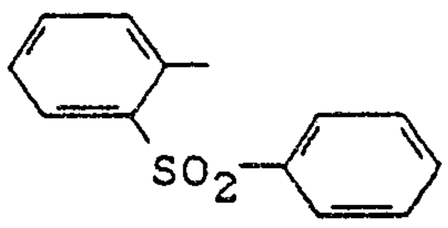
R^1	R^2	R^3	n
OC_3H_7	CH_2-CH=CH_2		0
CH_3	CH_3		0
	C_2H_5		2
	C_2H_5		0
C_2H_5	C_2H_5		0
CH_3	C_2H_5		0

Table 1: (Continuation)

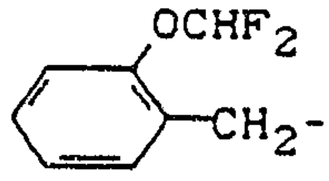
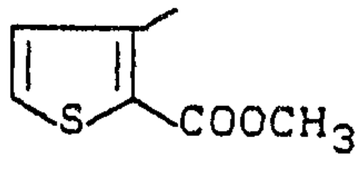
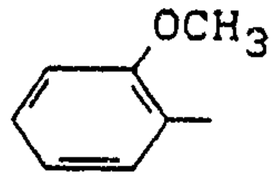
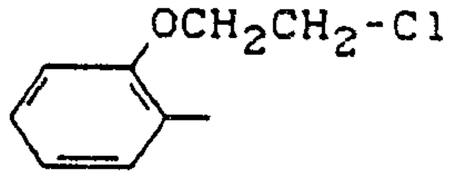
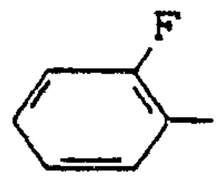
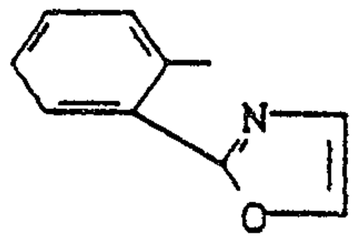
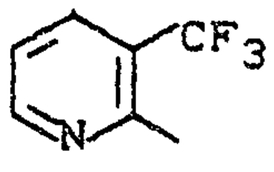
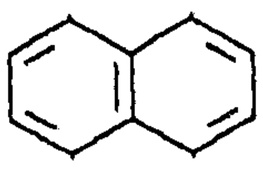
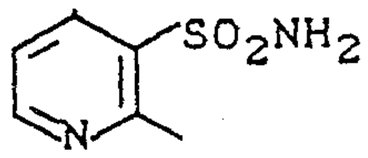
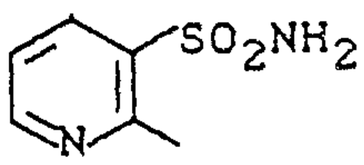
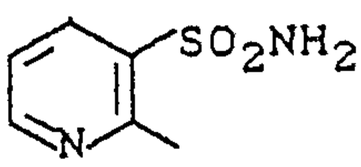
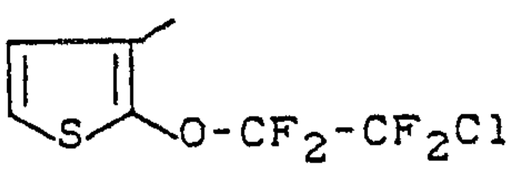
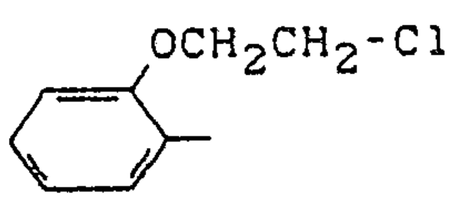
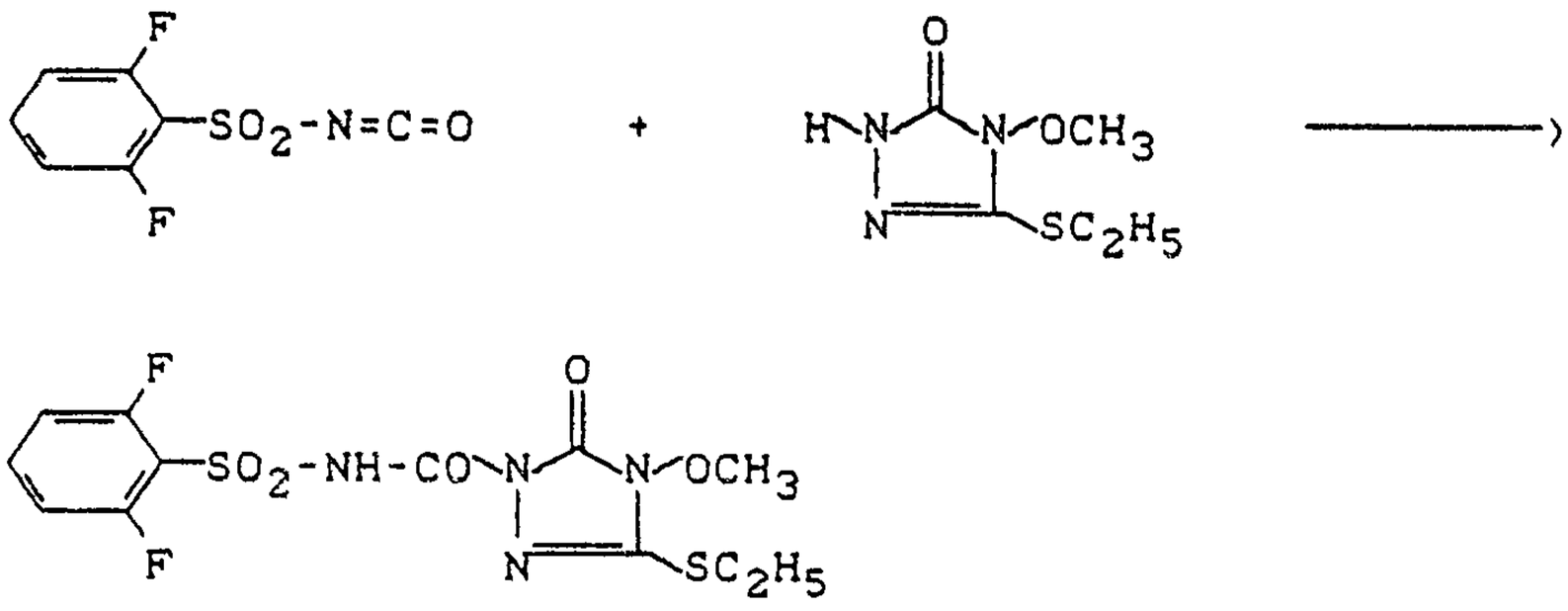
R^1	R^2	R^3	n
CH_3	C_3H_7		0
OCH_3	CH_3		0
OC_2H_5	CH_3		0
OC_2H_5	C_2H_5		0
$O-CH_2-CH=CH_2$	C_2H_5		0
CH_3	C_2H_5		0
CH_3	CH_3		0

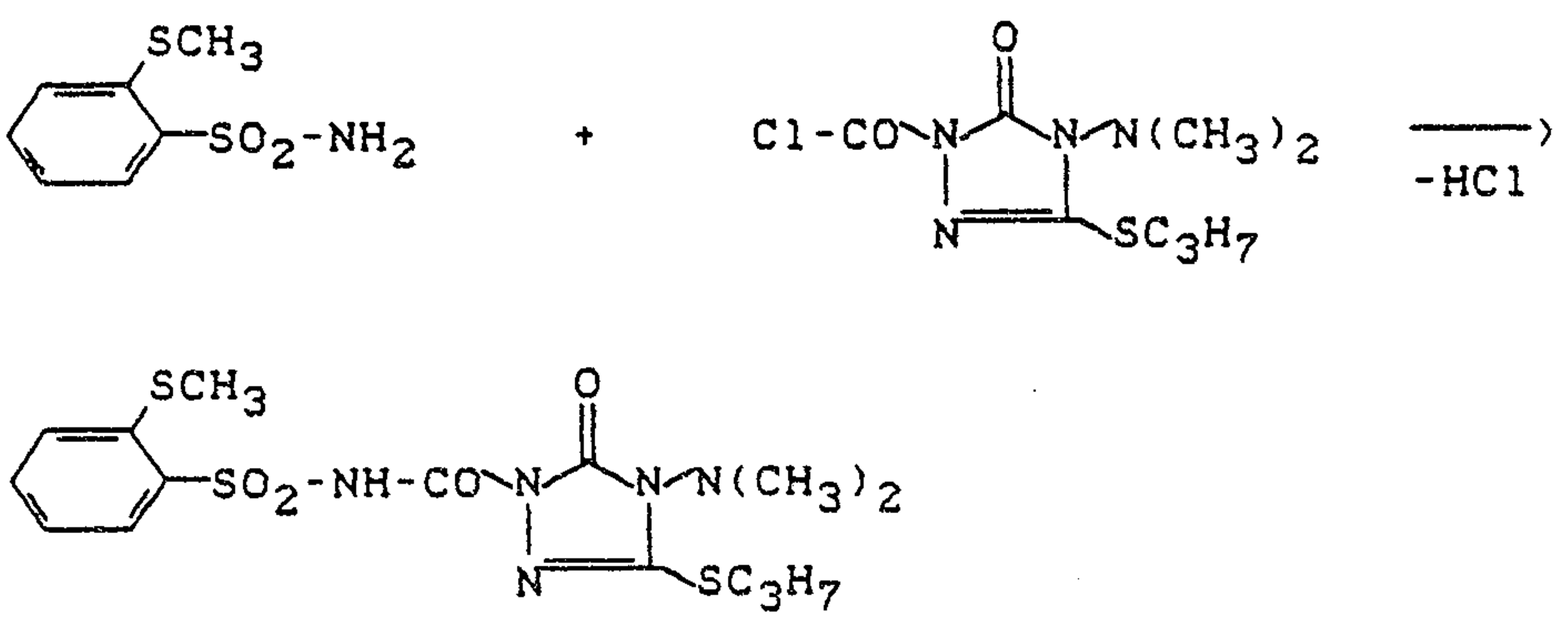
Table 1: (Continuation)

R^1	R^2	R^3	n
$N(CH_3)_2$	CH_3		0
CH_3	C_2H_5		0
OCH_3	C_2H_5		0
	CH_3		0
CH_3	C_2H_5		0
$N(CH_3)_2$	CH_3		0

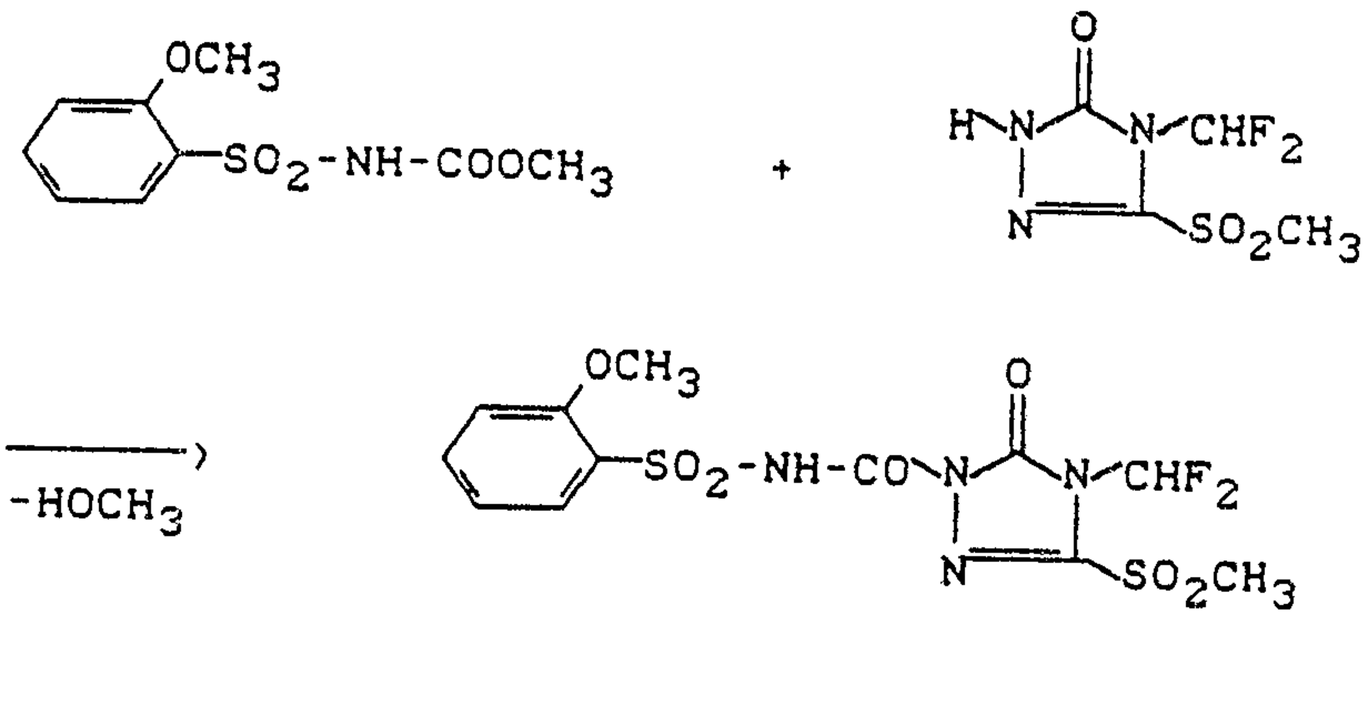
If, for example, 2,6-difluoro-phenyl isocyanate and 5-ethylthio-4-methoxy-2,4-dihydro-3H-1,2,4-triazol-3-one are used as starting substances, the course of the reaction in process (a) according to the invention can be outlined by the following equation:



If, for example, 2-methylthio-benzenesulphonamide and 2-chlorocarbonyl-4-dimethylamino-5-propylthio-2,4-dihydro-3H-1,2,4-triazol-3-one are used as starting substances, the course of the reaction in process (b) according to the invention can be outlined by the following equation:



If, for example, N-methoxycarbonyl-2-methoxy-benzenesulphonamide and 5-methylsulphonyl-4-difluoro-methyl-2,4-dihydro-3H-1,2,4-triazol-3-one are used as starting substances, the course of the reaction in process (c) according to the invention can be outlined by the following equation:

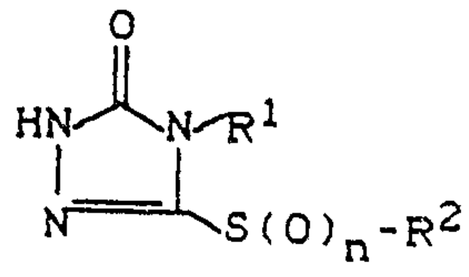


Formula (II) provides a general definition of the triazolinones to be used as starting substances in processes (a) and (c) according to the invention for the preparation of compounds of the formula (I).

In Formula (II), n, R^1 and R^2 preferably, or in particular, have those meanings which have already been mentioned above in connection with the description of the

compounds of the formula (I) according to the invention as being preferred, or particularly preferred, for n, R^1 and R^2.

Examples of the starting substances of the formula (II) are listed in Table 2 below.



(II)

Table 2: Examples of the starting substances of the formula (II)

R^1	R^2	n
H	CH_3	0
CH_3	CH_3	0
C_2H_5	CH_3	0
C_3H_7	CH_3	0
$CH(CH_3)_2$	CH_3	0
C_4H_9	CH_3	0

Table 2: (Continuation

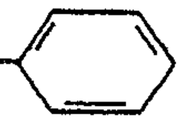
R^1	R^2	n
	CH_3	0
CH_3	C_2H_5	0
CH_3	C_3H_7	0
CH_3	$CH(CH_3)_2$	0
CH_3	$CH_2-CH=CH_2$	0
CH_3	CH_2 	0
CH_3	$CH_2-C\equiv CH$	0
C_2H_5	C_2H_5	0
C_3H_7	C_2H_5	0
	C_2H_5	0
$CH_2-CH=CH_2$	C_2H_5	0
$CH_2-CHBr-CH_2Br$	C_2H_5	0
	C_3H_7	0
	$CH_2-CH=CH_2$	0

Table 2: (Continuation

R^1	R^2	n
	$CH(CH_3)_2$	0
C_2H_5	$CH(CH_3)_2$	0
C_3H_7	$CH(CH_3)_2$	0
$CH_2-CH=CH_2$	C_3H_7	0
C_2H_5	C_3H_7	0
C_2H_5	$-CH_2-C\equiv CH$	0
C_3H_7	C_3H_7	0
OCH_3	CH_3	0
OCH_3	C_2H_5	0

The starting substances of the formula (II) are known and/or can be prepared by processes known per se (cf. J. Heterocycl. Chem. 15 (1978), pp. 377-384; DE-OS (German Published Specification) 2,250,572; DE-OS (German Published Specification) 2,527,676; DE-OS (German Published Specification) 3,709,574; US Patent 4,098,896; US Patent 4,110 332; JP-A-52-125 168).

Formula (III) provides a general definition of the sulphonyl isocyanates also to be used as starting substances in process (a) according to the invention for the preparation of compounds of the formula (I).

In formula (III), R^3 preferably, or in particular, has the meaning which has already been mentioned above in connection with the description of the compounds of the formula (I) according to the invention as being preferred, or particularly preferred, for R^3.

Examples of the starting substances of the formula (III) which may be mentioned are:
2-fluoro-, 2-chloro-, 2-bromo-, 2-methyl-, 2-methoxy-, 2-trifluoromethyl-, 2-difluoromethoxy-, 2-trifluoromethoxy-, 2-methylthio-, 2-ethylthio-, 2-propylthio-, 2-methylsulphinyl-, 2-methylsulphonyl-, 2-dimethylaminosulphonyl-, 2-diethylaminosulphonyl-, 2-(N-methoxy-N-methyl)-aminosulphonyl-, 2-phenyl-, 2-phenoxy-, 2-methoxycarbonyl-, 2-ethoxycarbonyl-, 2-propoxycarbonyl- and 2-isopropoxycarbonyl-phenylsulphonyl isocyanate, 2-fluoro-, 2-chloro-, 2-difluoromethoxy-, 2-trifluoromethoxy-, 2-methoxycarbonyl- and 2-ethoxycarbonyl-benzylsulphonyl isocyanate, 2-methoxycarbonyl-3-thienyl-sulphonyl isocyanate, 4-methoxycarbonyl- and 4-ethoxycarbonyl-1-

methyl-pyrazol-5-yl-sulphonylisocyanate.

The sulphonyl isocyanates of the formula (III) are known and/or can be prepared by processes known per se (cf. US Patent 4,127,405, 4,169,719, 4,371,391; EP-A 7,687, 13,480, 21,641, 23,141, 23,422, 30,139, 35,893, 44,808, 44,809, 48,143, 51,466, 64,322, 70,041, 173,312).

Process (a) according to the invention for the preparation of the new compounds of the formula (I) is preferably carried out using diluents. Suitable diluents for this purpose are virtually all inert organic solvents. These preferably include aliphatic and aromatic, optionally halogenated hydrocarbons, such as pentane, hexane, heptane, cyclohexane, petroleum ether, benzine, ligroin, benzene, toluene, xylene, methylene chloride, ethylene chloride, chloroform, carbon tetrachloride, chlorobenzene and o-dichlorobenzene, ethers, such as diethyl ether and dibutyl ether, glycol dimethyl ether and diglycol dimethyl ether, tetrahydrofuran and dioxane, ketones, such as acetone, methyl ethyl ketone, methyl isopropyl ketone and methyl isobutyl ketone, esters, such as methyl acetate and ethyl acetate, nitriles, such as, for example, acetonitrile and propionitrile, amides, such as, for example, dimethylformamide, dimethylacetamide and N-methyl-pyrrolidone, and also dimethyl sulphoxide, tetramethylene sulphone and hexamethylphosphoric triamide.

In process (a) according to the invention, the reaction temperatures can be varied within a substantial range. In general, the process is carried out at

temperatures between 0°C and 150°C, preferably at temperatures between 10°C and 80°C.

Process (a) according to the invention is generally carried out under atmospheric pressure.

For carrying out process (a) according to the invention, between 1 and 3 moles, preferably between 1 and 2 moles, of sulphonyl isocyanate of the formula (III) are generally employed per mole of triazolinone of the formula (II).

The reactants can be combined in any desired sequence. The reaction mixture is stirred until the reaction is complete, and the product is isolated by filtration with suction. In another work-up variant, the mixture is concentrated, and the crude product which remains in the residue is crystallized with a suitable solvent, such as, for example, diethyl ether. The product of the formula (I), which in this process is obtained in crystalline form, is isolated by filtration with suction.

Formula (IV) provides a general definition of the triazolinone derivatives to be used as starting substances in process (b) according to the invention for the preparation of compounds of the formula (I).

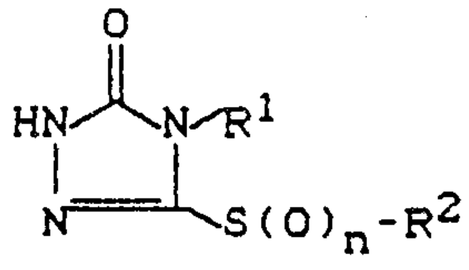
In formula (IV), n, R^1 and R^2 preferably, or in particular, have those meanings which have already been mentioned above in connection with the description of the compounds of the formula (I) according to the invention as being preferred, or particularly preferred, for n, R^1 and R^2, and

Z preferably represents chlorine, C_1-C_4-alkoxy, benzyloxy or phenoxy, in particular methoxy or phenoxy.

Possible examples of the starting substances of formula (IV) are the compounds of the formula (IV) to be prepared from the compounds of the formula (II) listed in Table 2 and phosgene, methyl chloroformate, benzyl chloroformate, phenyl chloroformate or diphenyl carbonate.

The starting substances of the formula (IV) were hitherto unknown.

The new triazolinone derivatives of the formula (IV) are obtained when triazolinones of the general formula (II)



(II)

in which

n, R^1 and R^2 have the abovementioned meanings,

are reacted with carbonic acid derivatives of the general formula (XI)

$$Z\text{-}CO\text{-}Z^1 \qquad (XI)$$

in which

Z has the abovementioned meaning and

Z^1 represents a leaving group, such as chlorine, methoxy, benzyloxy or phenoxy,

if appropriate in the presence of a diluent, such as, for

example, tetrahydrofuran, and if appropriate in the presence of an acid acceptor, such as, for example, sodium hydride or potassium tert-butylate, at temperatures between -20°C and +100°C (cf. also the Preparation Examples).

Formula (V) provides a general definition of the sulphonamides also to be used as starting substances in process (b) according to the invention for the preparation of compounds of the formula (I).

In formula (V), R^3 preferably, or in particular, has the meaning which has already been mentioned above in connection with the description of the compounds of the formula (I) according to the invention as being preferred, or particularly preferred, for R^3.

Examples of the starting substances of the formula (V) which may be mentioned are:
2-fluoro-, 2-chloro-, 2-bromo-, 2-methyl-, 2-methoxy-, 2-trifluoromethyl-, 2-difluoromethoxy-, 2-trifluoromethoxy-, 2-methylthio-, 2-ethylthio-, 2-propylthio-, 2-methylsulphinyl-, 2-methylsulphonyl-, 2-dimethylaminosulphonyl-, 2-diethylaminosulphonyl-, 2-(N-methoxy-N-methyl)-aminosulphonyl-, 2-phenyl-, 2-phenoxy-, 2-methoxycarbonyl-, 2-ethoxycarbonyl-, 2-propoxycarbonyl- and 2-isopropoxycarbonyl-benzenesulphonamide, 2-fluoro-, 2-chloro-, 2-difluoromethoxy-, 2-trifluoromethoxy-, 2-methoxycarbonyl- and 2-ethoxycarbonyl-phenylmethanesulphonamide, 2-methoxycarbonyl-3-thiophenesulphonamide, 4-methoxycarbonyl- and 4-ethoxycarbonyl-1-methyl-pyrazol-5-sulphonamide.

The sulphonamides of the formula (V) are known

and/or can be prepared by processes known per se (cf.US Patents 4,127,405, 4,169,719, 4,371,391; EP-A 7,687, 13,480, 21,641, 23,141, 23,422, 30,139, 35,893, 44,808, 44,809, 48,143, 51,466, 64,322, 70,041, 173,312).

In process (b) according to the invention, preparation of the new compounds of the formula (I) is preferably carried out using diluents. Diluents which are suitable for this purpose are virtually all inert organic solvents, for example those which have been indicated above for process (a) according to the invention.

Acid acceptors which can be employed in process (b) according to the invention are all acid-binding agents which can customarily be used for reactions of this type. The following are preferably suitable: alkali metal hydroxides, such as, for example, sodium hydroxide and potassium hydroxide, alkaline earth metal hydroxides, such as, for example, calcium hydroxide, alkali metal carbonates and alkali metal alcoholates, such as sodium carbonate, potassium carbonate, sodium tert-butylate and potassium tert-butylate, furthermore aliphatic, aromatic or heterocyclic amines, for example triethylamine, trimethylamine, dimethylaniline, dimethylbenzylamine, pyridine, 1,5-diazabicyclo-[4,3,0]-non-5-ene (DBN), 1,8-diazabicyclo-[5,4,0]-undec-7-ene (DBU) and 1,4-diazabicyclo[2,2,2]-octane (DABCO).

In process (b) according to the invention, the reaction temperatures can be varied within a substantial range. In general, the process is carried out at temperatures between 0°C and 100°C, preferably at temperatures between 10°C and 60°C.

In general, process (b) according to the invention is carried out under atmospheric pressure. However, it is also possible to carry out the process under increased or reduced pressure.

For carrying out process (b) according to the invention, the specifically required starting substances are generally employed in approximately equimolar amounts. However, it is also possible to use one of the two components employed in each case in a substantial excess. In general, the reactions are carried out in a suitable diluent in the presence of an acid acceptor, and the reaction mixture is stirred for several hours at the specifically required temperature. In process (b) according to the invention, working-up is carried out in each case by customary methods.

The triazolinones of the formula (II) to be used as starting substances in process (c) according to the invention for the preparation of compounds of the formula (I) have already been described as starting substances for process (a) according to the invention.

Formula (VI) provides a general definition of the sulphonamide derivatives also to be used as starting substances in process (c) according to the invention for the preparation of compounds of the formula (I).

In formula (VI), R^3 and Z preferably, or in particular, have those meanings which have already been mentioned above in connection with the description of the compounds of the formula (I), or (IV), according to the invention as being preferred, or particularly preferred, for R^3 and Z.

Process (c) according to the invention is preferably carried out using diluents. The same organic solvents which have been mentioned above in connection with the description of process (a) according to the invention are suitable for this purpose.

If appropriate, process (c) is carried out in the presence of an acid acceptor. The same acid-binding agents which have been mentioned above in connection with the description of process (b) according to the invention are suitable for this purpose.

In process (c) according to the invention, the reaction temperatures can be varied within a substantial range. In general, the process is carried out at temperatures between 0°C and 100°C, preferably at temperatures between 10°C and 60°C.

In general, process (c) according to the invention is carried out under atmospheric pressure. However, it is also possible to carry out the process under increased or reduced pressure.

For carrying out process (c) according to the invention, the specifically required starting substances are generally employed in approximately equimolar amounts. However, it is also possible to use one of the two specifically employed components in a substantial excess. In general, the reactions are carried out in a suitable diluent in the presence of an acid acceptor, and the reaction mixture is stirred for several hours at the specifically required temperature. In process (c) according to the invention, working-up is carried out in each case by customary methods.

For converting the compounds of the formula (I) into salts, they are stirred with suitable salt formers, such as, for example, sodium hydroxide, sodium methylate, sodium ethylate, potassium hydroxide, potassium methylate or potassium ethylate, ammonia, isopropylamine, dibutylamine or triethylamine, in suitable diluents, such as, for example, water, methanol or ethanol. The salts can be isolated as crystalline products - then if appropriate after concentration.

The active compounds according to the invention can be used as defoliants, desiccants, agents for destroying broad-leaved plants and, especially, as weed-killers. By weeds, in the broadest sense, there are to be understood all plants which grow in locations where they are undesired. Whether the substances according to the invention act as total or selective herbicides depends essentially on the amount used.

The active compounds according to the invention can be used, for example, in connection with the following plants:

Dicotyledon weeds of the genera: Sinapis, Lepidium, Galium, Stellaria, Matricaria, Anthemis, Galinsoga, Chenopodium, Urtica, Senecio, Amaranthus, Portulaca, Xanthium, Convolvulus, Ipomoea, Polygonum, Sesbania, Ambrosia, Cirsium, Carduus, Sonchus, Solanum, Rorippa, Rotala, Lindernia, Lamium, Veronica, Abutilon, Emex, Datura, Viola, Galeopsis, Papaver, Centaurea, Trifolium, Ranunculus and Taraxacum.

Dicotyledon cultures of the genera: Gossypium, Glycine, Beta, Daucus, Phaseolus, Pisum, Solanum, Linum, Ipomoea, Vicia, Nicotiana, Lycopersicon, Arachis,

Brassica, Lactuca, Cucumis and Cucurbita.

Monocotyledon weeds of the genera: Echinochloa, Setaria, Panicum, Digitaria, Phleum, Poa, Festuca, Eleusine, Brachiaria, Lolium, Bromus, Avena, Cyperus, Sorghum, Agropyron, Cynodon, Monochoria, Fimbristylis, Sagittaria, Eleocharis, Scirpus, Paspalum, Ischaemum, Sphenoclea, Dactyloctenium, Agrostis, Alopecurus and Apera.

Monocotyledon cultures of the genera: Oryza, Zea, Triticum, Hordeum, Avena, Secale, Sorghum, Panicum, Saccharum, Ananas, Asparagus and Allium.

However, the use of the active compounds according to the invention is in no way restricted to these genera, but also extends in the same manner to other plants.

The compounds are suitable, depending on the concentration, for the total combating of weeds, for example on industrial terrain and rail tracks, and on paths and squares with or without tree plantings. Equally, the compounds can be employed for combating weeds in perennial cultures, for example afforestations, decorative tree plantings, orchards, vineyards, citrus groves, nut orchards, banana plantations, coffee plantations, tea plantations, rubber plantations, oil palm plantations, cocoa plantations, soft fruit plantings and hop-fields, on lawn, turf and pasture-land, and for the selective combating of weeds in annual cultures.

In particular, the compounds of the formula (I) according to the invention are suitable for selectively combating monocotyledon and dicotyledon weeds in mono-

cotyledon crops, either using the pre-emergence or the post-emergence method. They are markedly more effective than, for example, isocarbamid.

To a certain extent, the compounds according to the invention also show fungicidal action, for example against Pyricularia on rice.

The active compounds can be converted into the customary formulations, such as solutions, emulsions, wettable powders, suspensions, powders, dusting agents, pastes, soluble powders, granules, suspension-emulsion concentrates, natural and synthetic materials impregnated with active compound, and very fine capsules in polymeric substances.

These formulations are produced in a known manner, for example by mixing the active compounds with extenders, that is liquid solvents and/or solid carriers, optionally with the use of surface-active agents, that is emulsifying agents and/or dispersing agents and/or foam-forming agents.

In the case of the use of water as an extender, organic solvents can, for example, also be used as auxiliary solvents. As liquid solvents, there are suitable in the main: aromatics, such as xylene, toluene or alkylnaphthalenes, chlorinated aromatics and chlorinated aliphatic hydrocarbons, such as chlorobenzenes, chloroethylenes or methylene chloride, aliphatic hydrocarbons, such as cyclohexane or paraffins, for example petroleum fractions, mineral and vegetable oils, alcohols, such as butanol or glycol as well as their ethers and esters, ketones, such as acetone, methyl ethyl ketone, methyl

isobutyl ketone or cyclohexanone, strongly polar solvents, such as dimethylformamide and dimethyl sulphoxide, as well as water.

As solid carriers there are suitable: for example ammonium salts and ground natural minerals, such as kaolins, clays, talc, chalk, quartz, attapulgite, montmorillonite or diatomaceous earth, and ground synthetic minerals, such as highly-disperse silica, alumina and silicates, as solid carriers for granules there are suitable: for example crushed and fractionated natural rocks such as calcite, marble, pumice, sepiolite and dolomite, as well as synthetic granules of inorganic and organic meals, and granules of organic material such as sawdust, coconut shells, maize cobs and tobacco stalks; as emulsifying and/or foam-forming agents there are suitable: for example non-ionic and anionic emulsifiers, such as polyoxyethylene fatty acid esters, polyoxyethylene fatty alcohol ethers, for example alkylaryl polyglycol ethers, alkylsulphonates, alkyl sulphates, arylsulphonates as well as albumen hydrolysis products; as dispersing agents there are suitable: for example lignin-sulphite waste liquors and methylcellulose.

Adhesives such as carboxymethylcellulose and natural and synthetic polymers in the form of powders, granules or latexes, such as gum arabic, polyvinyl alcohol and polyvinyl acetate, as well as natural phospholipids, such as cephalins and lecithins, and synthetic phospholipids, can be used in the formulations. Further additives can be mineral and vegetable oils.

It is possible to use colorants such as inorganic

pigments, for example iron oxide, titanium oxide and Prussian Blue, and organic dyestuffs, such as alizarin dyestuffs, azo dyestuffs and metal phthalocyanine dyestuffs, and trace nutrients such as salts of iron, manganese, boron, copper, cobalt, molybdenum and zinc.

The formulations in general contain between 0.1 and 95 per cent by weight of active compound, preferably between 0.5 and 90%.

For combating weeds, the active compounds according to the invention, as such or in the form of their formulations, can also be used as mixtures with known herbicides, finished formulations or tank mixes being possible.

Suitable herbicides for the mixtures are known herbicides, such as, for example, 1-amino-6-ethylthio-3-(2,2-dimethylpropyl)-1,3,5-triazine-2,4-(1H,3H)-dione (AMETHYDIONE) or N-(2-benzothiazolyl)-N,N'-dimethylurea (METABENZTHIAZURON) for combating weeds in cereals; 4-amino-3-methyl-6-phenyl-1,2,4-triazin-5(4H)-one (METAMITRON) for combating weeds in sugar beet, and 4-amino-6-(1,1-dimethylethyl)-3-methylthio-1,2,4-triazin-5(4H)-one (METRIBUZIN) for combating weeds in soya beans; furthermore also 2,4-dichlrophenoxyacetic acid (2,4-D); 4-(2,4-dichlorophenoxy)-butyric acid (2,4-DB); 2,4-dichlorophenoxypropionic acid (2,4-DP); 3-isopropyl-2,1,3-benzothiadiazin-4-one 2,2-dioxide (BENTAZONE); methyl 5-(2,4-dichlorophenoxy)-2-nitrobenzoate (BIFENOX); 3,5-dibromo-4-hydroxy-benzonitrile (BROMOXYNIL); 2-chloro-N{[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-amino]-carbonyl}benzenesulphonamide (CHLORSULFURON); N,N-dimethyl-

N'-(3-chloro-4-methylphenyl)-urea (CHLORTOLURON); 2-[4-(2,4-dichlorophenoxy)-phenoxy]-propionic acid, its methyl ester or its ethyl ester (DICLOFOP); 4-amino-6-t-butyl-3-ethylthio-1,2,4-triazin-5(4H)-one (ETHIOZIN); 2-{4-[(6-chloro-2-benzoxazolyl)-oxy]-phenoxy}-propanoic acid, its methyl ester or its ethyl ester (FENOXAPROP); [(4-amino-3,5-dichloro-6-fluoro-2-pyridin-yl)-oxy]-acetic acid or its 1-methylheptyl ester (FLUROXYPYR); N-phosphonomethyl-glycin (GLYPHOSATE); methyl 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-4(5)-methylbenzoate (IMAZAMETHABENZ); 3,5-diiodo-4-hydroxybenzonitrile (IOXYNIL); N,N-dimethyl-N'-(4-isopropylphenyl)-urea (ISOPROTURON); (2-methyl-4-chlorophenoxy)-acetic acid (MCPA); (4-chloro-2-methylphenoxy)-propionic acid (MCPP); N-methyl-2-(1,3-benzothiazol-2-yloxy)-acetanilide (MEFENACET); 2-{[[((4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino)-carbonyl]-amino]-sulphonyl}-benzoic acid or its methyl ester (METSULFURON); N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitroaniline (PENDIMETHALIN); 0-(6-chloro-3-phenyl-pyridazin-4-yl)-S-octyl thiocarbamate (PYRIDATE); 4-ethylamino-2-t-butylamino-6-methylthio-s-triazine (TERBUTRYNE) and methyl 3-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-amino]-carbonyl]-amino]-sulphonyl]-thiophene-2-carboxylate (THIAMETURON). Surprisingly, some mixtures also show synergistic action.

Mixtures with other known active compounds, such as fungicides, insecticides, acaricides, nematicides, bird repellants, plant nutrients and agents which improve soil structure, are also possible.

The active compounds can be used as such, in the

form of their formulations or in the use forms prepared therefrom by further dilution, such as ready-to-use solutions, suspensions, emulsions, powders, pastes and granules. They are used in the customary manner, for example by watering, spraying, atomizing or scattering.

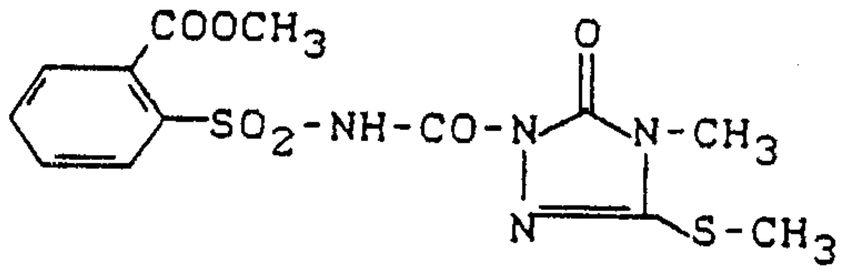
The active compounds according to the invention can be applied either before or after emergence of the plants. They can also be incorporated into the soil before sowing.

The amount of active compound used can vary within a substantial range. It depends essentially on the nature of the desired effect. In general, the amounts used are between 0.01 and 15 kg of active compound per hectare of soil surface, preferably between 0.05 and 10 kg per ha.

The preparation and use of the active compounds according to the invention can be seen from the following examples.

Preparation Examples

Example 1



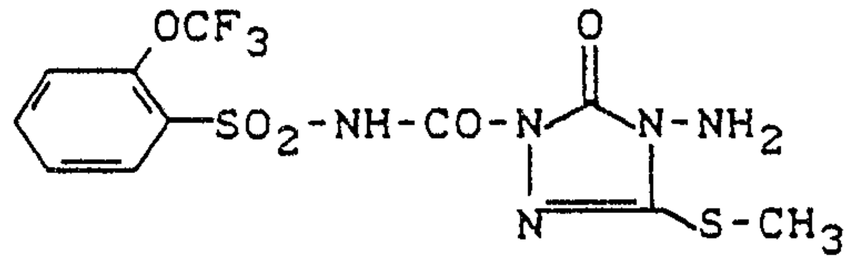
(Process (a))

3.0 g (20.7 mmol) of 4-methyl-5-methylthio-2,4-dihydro-3H-1,2,4-triazol-3-one are dissolved in 60 ml of

acetonitrile, and 7.0 g (29 mmol) of 2-methoxycarbonyl-phenylsulphonyl-isocyanate, dissolved in 20 ml of acetonitrile, are added to this solution with stirring. The reaction mixture is stirred at 20°C for 6 hours. The product which is obtained in crystalline form is then isolated by filtration with suction.

This gives 6.0 g (75 % of theory) of 4-methyl-5-methylthio-2-(2-methoxycarbonyl-phenylsulphonyl-amino-carbonyl)-2,4-dihydro-3H-1,2,4-triazol-3-one of melting point 184°C.

Example 2



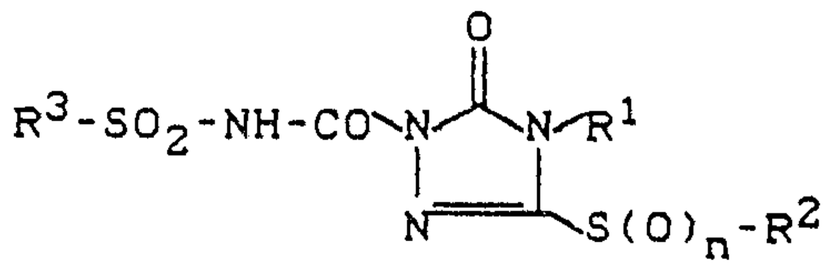
(Process (b))

1.7 g (11.2 mmol) of 1,8-diazabicyclo-[5,4,0]-undec-7-ene (DBU) and 2.7 g (11.2 mmol) of 2-trifluoro-methoxybenzenesulphonamide are added to a solution of 3.0 g (11.3 mmol) of 4-amino-5-methylthio-2-phenoxy-carbonyl-2,4-dihydro-3H-1,2,4-triazol-3-one in 60 ml of methylene chloride. The reaction mixture is stirred for 4 hours at 20°C, then washed twice with 1 % strength hydrochloric acid and three times with water, dried with sodium sulphate, and filtered. The filtrate is concentrated, the residue is stirred with diethyl ether, and the product which is obtained in crystalline form is

isolated by filtration with suction.

This gives 2.1 g (45 % of theory) of 4-amino-5-methylthio-2-(2-trifluoromethoxy-phenylsulphonyl-aminocarbonyl)-2,4-dihydro-3H-1,2,4-triazol-3-one of melting point 136°C.

For example, the compounds of the formula (I) listed in Table 3 below can also be prepared analogously to Examples 1 and 2 and following the general description of the preparation processes according to the invention.



(I)

Table 3: Preparation Examples of the compounds of the formula (I)

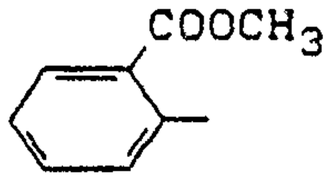
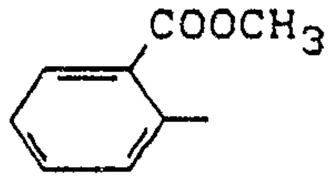
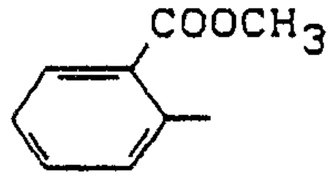
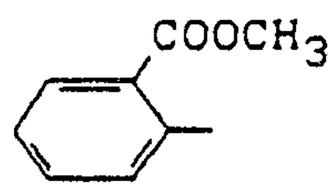
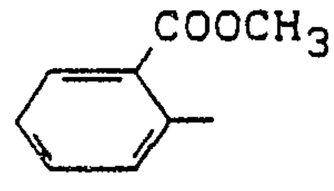
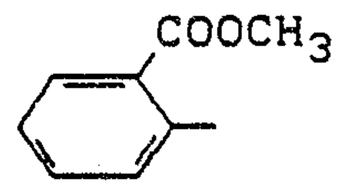
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
3	CH_3	C_2H_5		0	149
4	CH_3	$CH(CH_3)_2$		0	161
5	CH_3	$CH_2CH=CH_2$		0	140
6	C_2H_5	C_2H_5		0	128
7	C_2H_5	CH_3		0	167
8	C_2H_5	$CH_2C_6H_5$		0	185

Table 3: (Continuation)

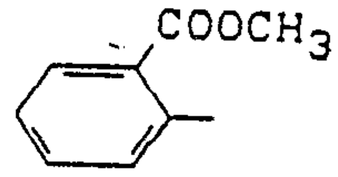
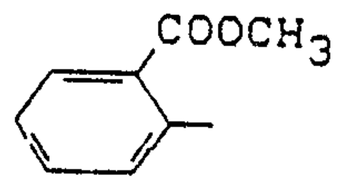
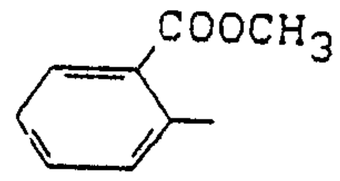
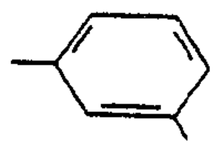
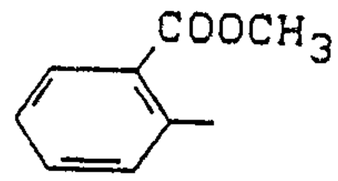
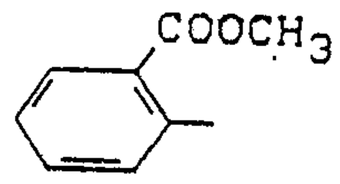
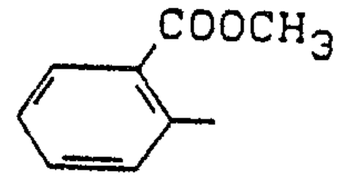
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
9	CH_3	$CH_2C_6H_5$		0	143
10	$CH_2C_6H_5$	CH_3		0	134
11	$CH(CH_3)_2$	CH_3		0	142
12		CH_3		0	205
13	CH_3	C_3H_7		0	142
14	C_2H_5	$-CH_2CH=CH_2$		0	111

Table 3: (Continuation)

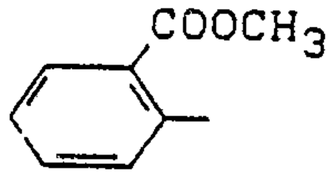
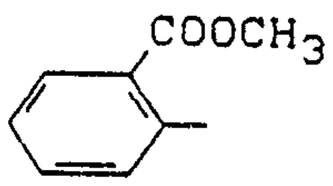
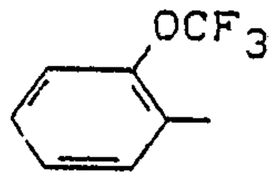
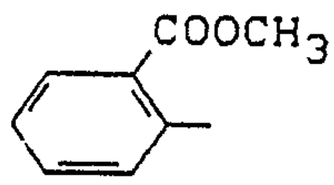
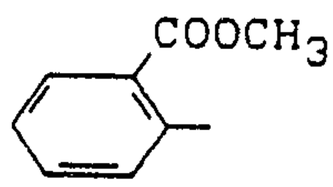
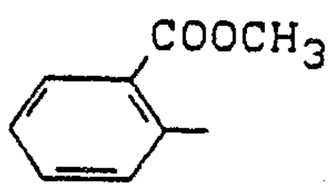
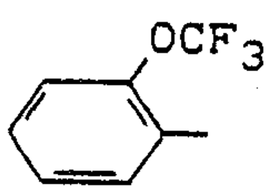
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
15	C_2H_5	C_3H_7		0	125
16	C_2H_5	$CH(CH_3)_2$		0	131
17	CH_3	CH_3		0	150
18	C_3H_7	$-CH_2CH=CH_2$		0	128
19	C_3H_7	C_3H_7		0	137
20	C_3H_7	$CH(CH_3)_2$		0	121
21	CH_3	C_2H_5		0	133

Table 3: (Continuation)

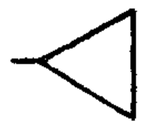
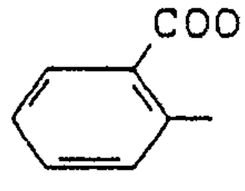
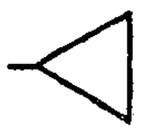
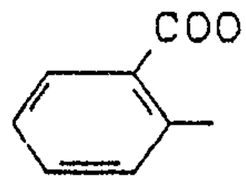
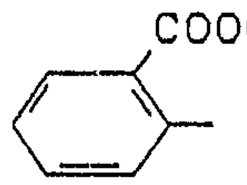
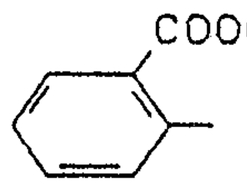
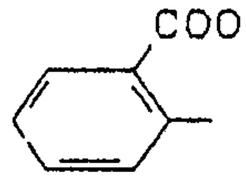
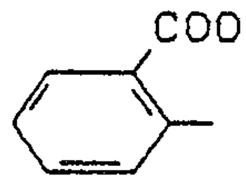
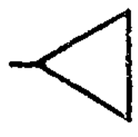
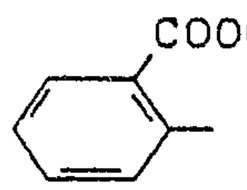
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
22		$-CH_2CH=CH_2$		0	151
23		C_3H_7		0	149
24		$CH(CH_3)_2$		0	163
25	C_3H_7	CH_3		0	144
26	C_3H_7	C_2H_5		0	130
27		C_2H_5		0	173
28		CH_3		0	173

Table 3: (Continuation)

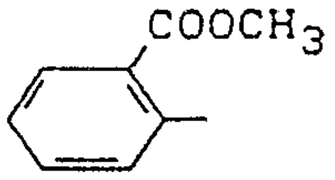
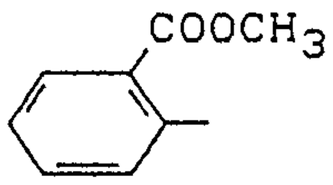
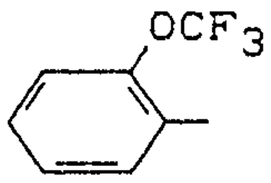
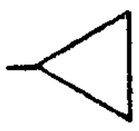
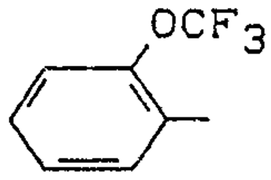
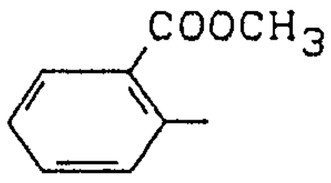
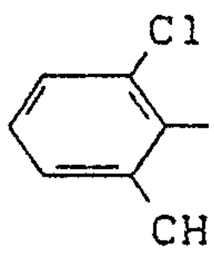
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
29	$-CH_2-CH=CH_2$	CH_3		0	137
30	$-CH_2-CH=CH_2$	C_2H_5		0	128
31		CH_3		0	182
32		C_2H_5		0	152
33	CH_3	CH_3		2	176
34	CH_3	C_2H_5		0	138

Table 3: (Continuation)

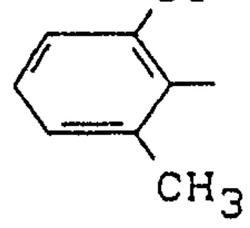
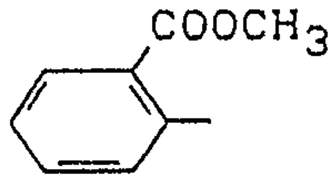
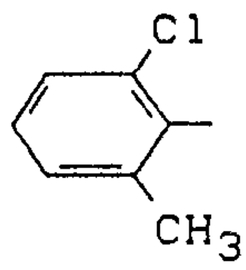
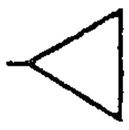
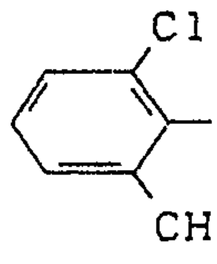
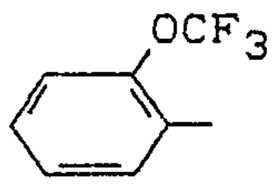
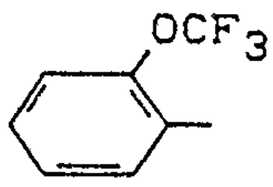
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
35	CH_3	CH_3		0	175
36	$-CH_2-CH=CH_2$	$-CH_2-CH=CH_2$		0	101
37		CH_3		0	190
38		C_2H_5		0	163
39	$-CH_2-CH=CH_2$	CH_3		0	163
40	$-CH_2-CH=CH_2$	C_2H_5		0	133

Table 3: (Continuation)

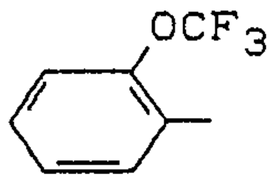
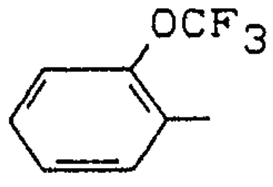
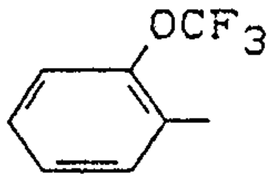
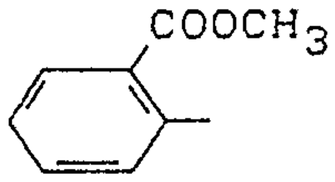
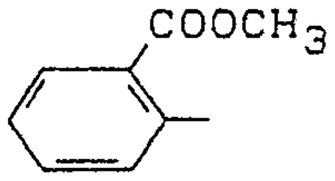
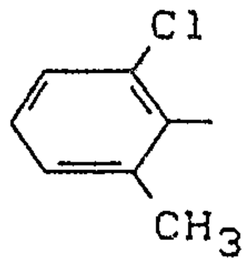
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
41	CH_3	C_3H_7		0	133
42	C_2H_5	$-CH_2-CH=CH_2$		0	107
43		C_3H_7		0	121
44	$-CH_2-CH=CH_2$	C_3H_7		0	124
45	$-CH_2-CH=CH_2$	$CH(CH_3)_2$		0	94
46	CH_3	$CH(CH_3)_2$		0	142

Table 3: (Continuation)

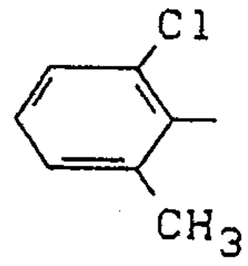
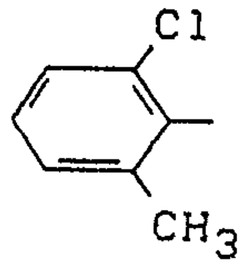
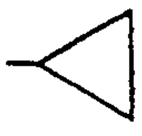
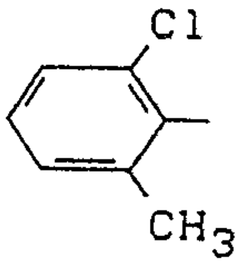
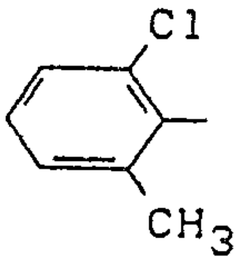
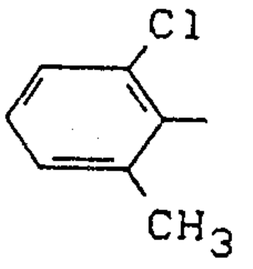
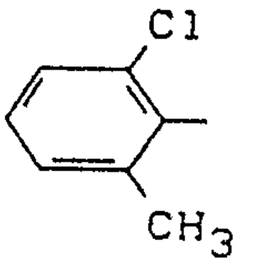
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
47	$-CH_2-CH=CH_2$	CH_3		0	165
48	$-CH_2-CH=CH_2$	C_2H_5		0	140
49		$CH(CH_3)_2$		0	131
50		C_3H_7		0	138
51	C_2H_5	CH_3		0	168
52	C_2H_5	C_2H_5		0	129

Table 3: (Continuation)

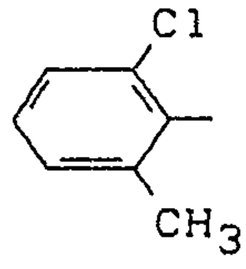
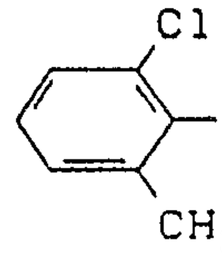
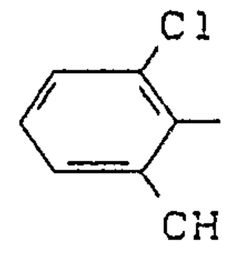
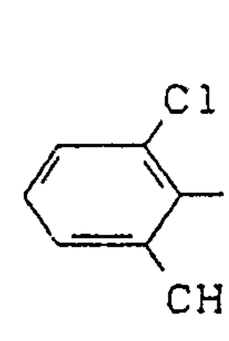
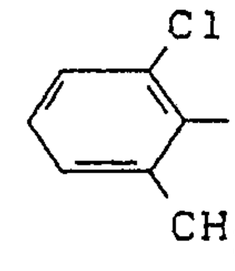
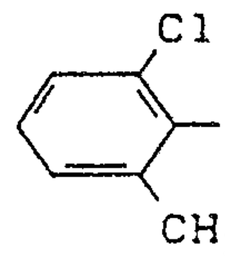
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
53	CH_3	C_3H_7		0	146
54	CH_3	$-CH_2-CH=CH_2$		0	125
55		$-CH_2-CH=CH_2$		0	141
56	C_2H_5	C_3H_7		0	122
57	C_2H_5	$-CH_2-CH=CH_2$		0	96
58	$-CH_2-CH=CH_2$	$-CH_2-CH=CH_2$		0	113

Table 3: (Continuation)

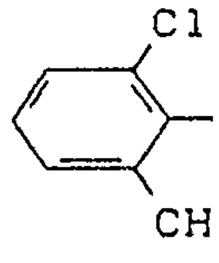
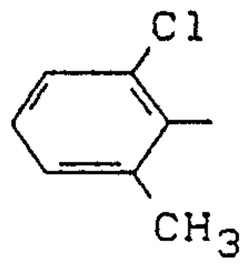
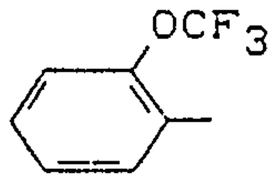
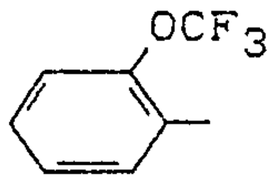
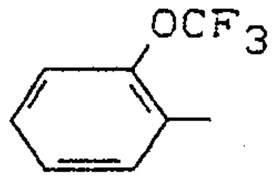
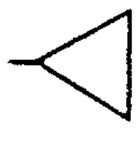
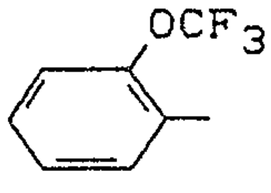
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
59	$-CH_2-CH=CH_2$	C_3H_7		0	102
60	$-CH_2-CH=CH_2$	$CH(CH_3)_2$		0	122
61	CH_3	$CH(CH_3)_2$		0	106
62	CH_3	$-CH_2-CH=CH_2$		0	125
63		$-CH_2-CH=CH_2$		0	128
64		$CH(CH_3)_2$		0	127

Table 3: (Continuation)

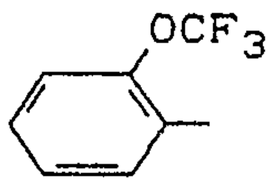
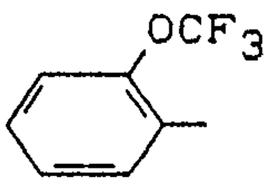
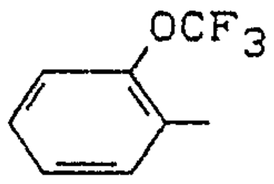
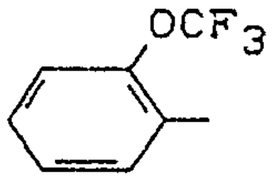
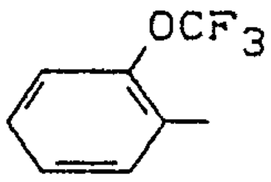
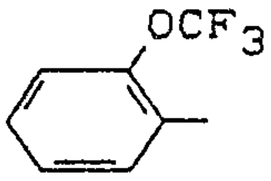
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
65	C_2H_5	CH_3		0	171
66	C_2H_5	C_2H_5		0	138
67	$-CH_2-CH=CH_2$	C_3H_7		0	89
68	C_2H_5	C_3H_7		0	127
69	$-CH_2-CH=CH_2$	$CH(CH_3)_2$		0	117
70	$-CH_2-CH=CH_2$	$-CH_2-CH=CH_2$		0	79

Table 3: (Continuation)

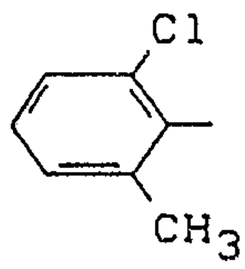
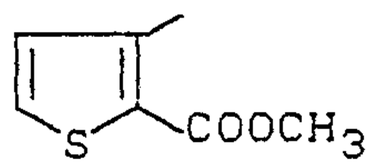
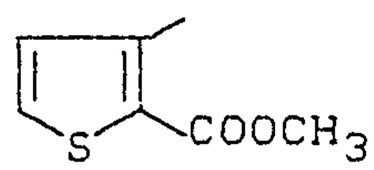
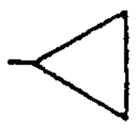
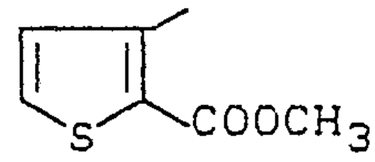
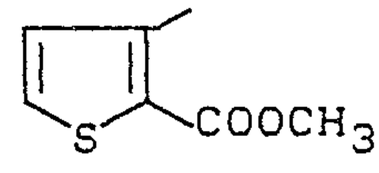
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
71	C_2H_5	$CH(CH_3)_2$		0	137
72	CH_3	CH_3		0	193-194
73	CH_3	C_2H_5		0	176-177
74		CH_3		0	175-177
75		C_2H_5		0	153-155

Table 3: (Continuation)

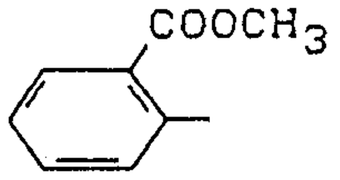
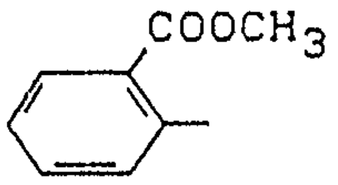
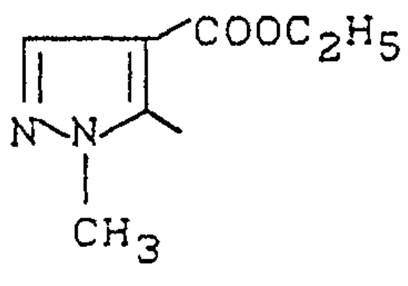
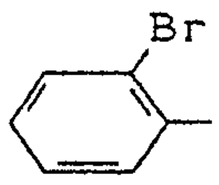
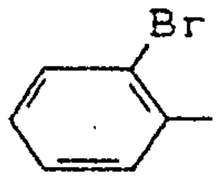
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
76	$N(CH_3)_2$	CH_3		0	178-179
77	$N(CH_3)_2$	C_2H_5		0	134-136
78		CH_3		0	188-191
79	CH_3	CH_3		0	176-179
80	CH_3	C_2H_5		0	154-156

Table 3: (Continuation)

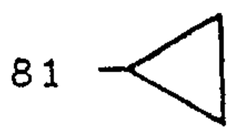
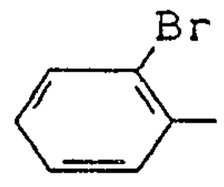
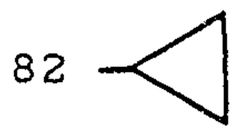
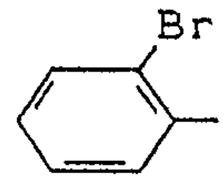
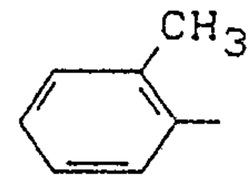
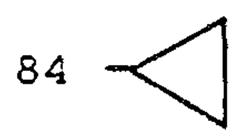
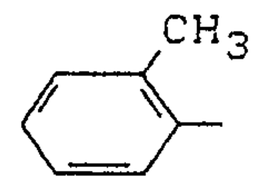
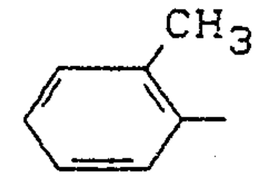
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
81		CH_3		0	192-195
82		C_2H_5		0	151-154
83	CH_3	CH_3		0	157
84		CH_3		0	168
85	CH_3	C_2H_5		0	132

Table 3: (Continuation)

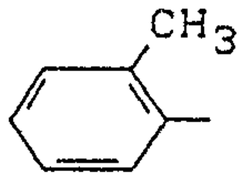
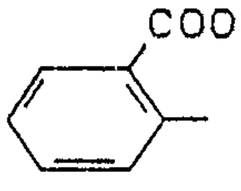
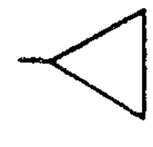
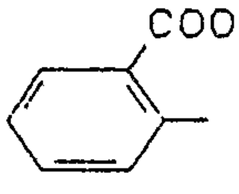
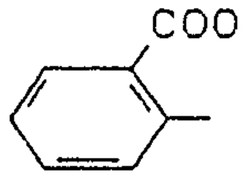
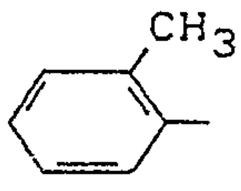
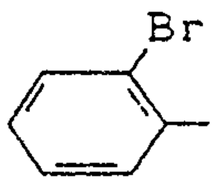
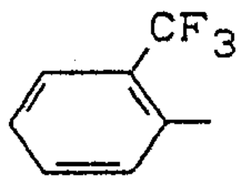
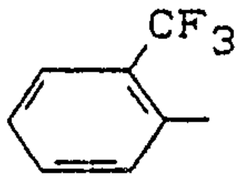
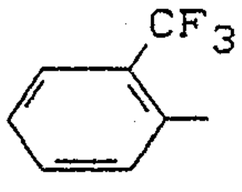
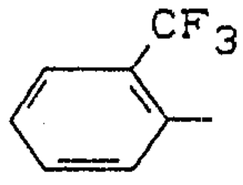
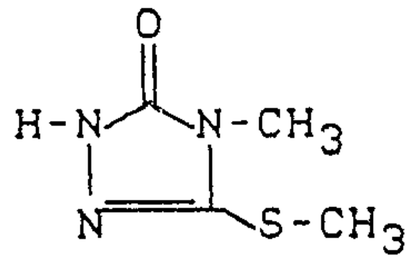
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
86		C_2H_5		0	137
87	$-CH_2-CH=CH_2$	$-CH_2-C\equiv CH$		0	95
88		$-CH_2-C\equiv CH$		0	128-131
89	CH_3	$-CH_2-C\equiv CH$		0	143-144
90	CH_3	$-CH(CH_3)_2$		0	107-109
91	CH_3	$-CH(CH_3)_2$		0	103-104

Table 3: (Continuation)

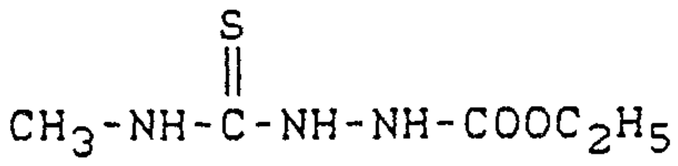
Ex. No.	R^1	R^2	R^3	n	Melting point (°C)
92	CH_3	$-CH(CH_3)_2$		0	114-117
93		CH_3		0	194-195
94		C_2H_5		0	150-152
95	CH_3	C_2H_5		0	146-148

Starting substances of the formula (II)

Example (II-1)



Step 1



A solution of 175 g (2.4 mol) of methyl isothiocyanate in 300 ml of diethyl ether is added to a solution of 250 g (2.4 mol) of ethyl hydrazinoformate, with stirring. The reaction mixture is stirred for 12 hours at 20°C and then cooled to about 10°C, and the product which is obtained in crystalline form is isolated by filtration with suction. This gives 404 g (95 % of theory) of 4-methyl-1-ethoxycarbonylthiosemicarbazide of melting point 130°C.

The following are obtained analogously:

4-ethyl-1-methoxycarbonyl-thiosemicarbazide (melting point: 142°C);

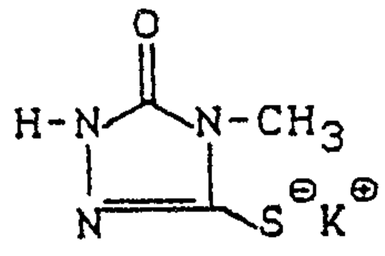
4-propyl-1-methoxycarbonyl-thiosemicarbazide (melting point: 117°C

4-cyclopropyl-1-methoxycarbonyl-thiosemicarbazide (melting point: 148°C);

4-allyl-1-methoxycarbonyl-thiosemicarbazide (melting point: 151°C);

4-dimethylamino-1-methoxycarbonyl-thiosemicarbazide (melting point: 144°C).

Step 2

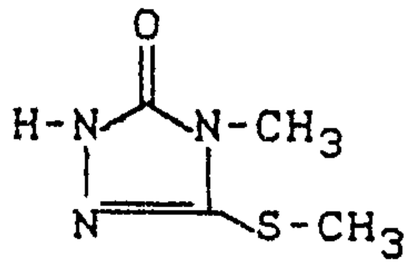


A mixture of 10.0g (56.5 mmol) of 4-methyl-1-ethoxycarbonyl-thiosemicarbazide (cf. Step 1), 4.0 g (29 mmol) of potassium carbonate and 80 ml of ethanol is refluxed until the evolution of gas has ceased (about 3 hours). When the mixture is cold, it is concentrated, the residue is stirred with 50 ml of methylene chloride, and the product, which has remained undissolved, is isolated by filtration with suction.

This gives 9.2 g (96 % of theory) of the potassium salt of 5-mercapto-4-methyl-2,4-dihydro-3H-1,2,4-triazol-3-one (melting point >230°C).

The potassium salts of 5-mercapto-4-ethyl-2,4-dihydro-3H-1,2,4-triazol-3-one, 5-mercapto-4-propyl-2,4-dihydro-3H-1,2,4-triazol-3-one, 5-mercapto-4-cyclopropyl-2,4-dihydro-3H-1,2,4-triazol-3-one, and 5-mercapto-4-allyl-2,4-dihydro-3H-1,2,4-triazol-3-one, and 5-mercapto-4-dimethylamino-2,4-dihydro-3H-1,2,4-triazol-3-one, all of which melt above 230 °C, are obtained analogously.

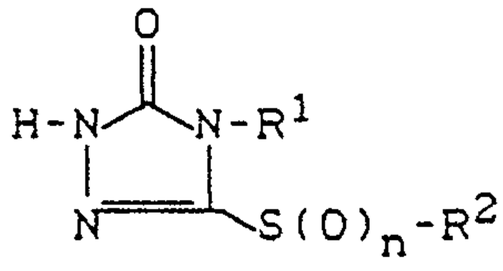
Step 3



A mixture of 4.0 g (23.7 mmol) of the potassium salt of 5-mercapto-4-methyl-2,4-dihydro-3H-1,2,4-triazol-3-one (cf. Step 2), 4.1 g (28.9 mmol) of methyl iodide and 80 ml of methanol is stirred for 12 hours at 20°C. The mixture is then concentrated, the residue is stirred with methylene chloride, and the potassium iodide, which has remained undissolved, is separated off by filtration. The filtrate is concentrated, the residue is stirred with 500 ml of diethyl ether/petroleum ether (1:1 by vol.), and the product which has been obtained in crystalline from is isolated by filtration with suction.

This gives 3.4 g (99 % of theory) of 4-methyl-5-methylthio-2,4-dihydro-3H-1,2,4-triazol-3-one of melting point 97°C.

For example the compounds of the formula (II) listed in Table 4 below can also be prepared analogously to Example (II-1).



(II)

Table 4 Preparation Examples of the compounds of the formula (II)

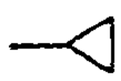
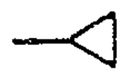
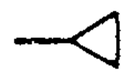
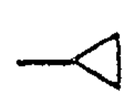
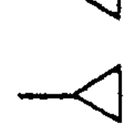
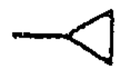
Ex. No.	R^1	R^2	n	m.p. (°C) (Refractive index)
II-2	CH_3	C_2H_5	0	97
II-3	CH_3	C_3H_7	0	50
II-4	CH_3	$CH(CH_3)_2$	0	91
II-5	CH_3	$-CH_2CH=CH_2$	0	58
II-6	CH_3	$-CH_2C_6H_5$	0	
II-7	C_2H_5	CH_3	0	95
II-8	C_2H_5	C_2H_5	0	87
II-9	C_2H_5	C_3H_7	0	73
II-10	C_2H_5	$CH(CH_3)_2$	0	42
II-11	C_2H_5	$-CH_2CH=CH_2$	0	(n_D^{20} : 1,5400)
II-12	C_2H_5	$-CH_2C_6H_5$	0	
II-13	C_3H_7	CH_3	0	78
II-14	C_3H_7	C_2H_5	0	(n_D^{20} : 1,5215)
II-15	C_3H_7	C_3H_7	0	56
II-16	C_3H_7	$CH(CH_3)_2$	0	55
II-17	C_3H_7	$-CH_2CH=CH_2$	0	(n_D^{20} : 1,5350)
II-18	$CH(CH_3)_2$	CH_3	0	
II-19		CH_3	0	160
II-20		C_2H_5	0	119

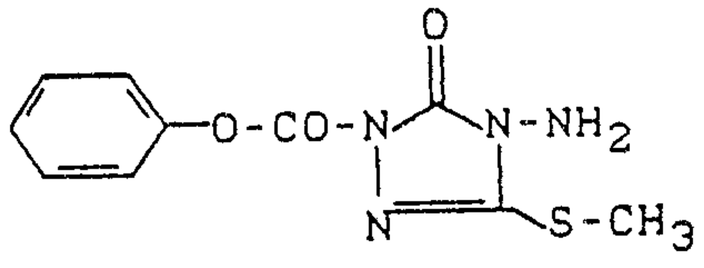
Table 4 (Continuation)

Ex. No.	R^1	R^2	n	m.p. (°C) (Refractive index)
II-21		C_3H_7	0	94
II-22		$CH(CH_3)_2$	0	94
II-23		$-CH_2CH=CH_2$	0	105
II-24	$-CH_2C_6H_5$	CH_3	0	135
II-25	$-CH_2CH=CH_2$	CH_3	0	70
II-26	$-CH_2CH=CH_2$	C_2H_5	0	55
II-27	CH_3	CH_3	2	166
II-28	$-CH_2-CH=CH_2$	$-CH_2-CH=CH_2$	0	(amorphous)*
II-29	$-CH_2-CH=CH_2$	$CH(CH_3)_2$	0	57
II-30	$-CH_2-CH=CH_2$	C_3H_7	0	45
II-31	$-N(CH_3)_2$	CH_3	0	168-169
II-32	$-N(CH_3)_2$	C_2H_5	0	146
II-33	CH_3	$-CH_2-C\equiv CH$	0	153
II-34		$-CH_2-C\equiv CH$	0	153-154
II-35	$-CH_2-CH=CH_2$	$-CH_2-C\equiv CH$	0	102-103

* ^{1}H-NMR (D_6-DMSO, 360 MHz): δ = 3,66 (d, S-C<u>H</u>$_2$-); 4,17 (m, N-C<u>H</u>$_2$-); 4,95-5,28 (m, 2C<u>H</u>$_2$=); 5,75-5,99 (m, 2C<u>H</u>=); 12,0 (N<u>H</u>) ppm.

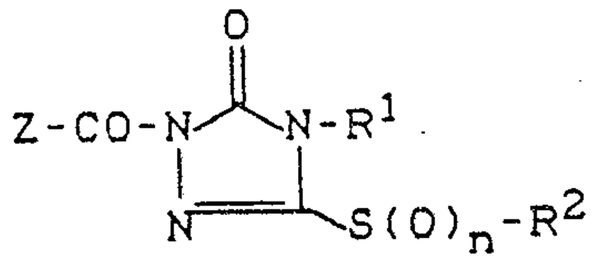
Starting substances of the formula (IV):

Example (IV-1)



22.1 g (0.141 mol) of phenyl chloroformate are added to a mixture of 20.0g (0.137 mol) of 4-amino-5-methylthio-2,4-dihydro-3H-1,2,4-triazol-3-one, 5.6 g (0.141 mol) of sodium hydroxide, 0.2 g of tetrabutylammonium bromide and 200 ml of methylene chloride/water (1:1, by vol.), with vigorous stirring. The reaction mixture is stirred for 12 hours at 20°C, and the product which is obtained in crystalline form is isolated by filtration with suction. This gives 34.8 g (95 % of theory) of 4-amino-5-methylthio-2-phenoxycarbonyl-2,4-dihydro-3H-1,2,4-triazol-3-one of melting point 211°C.

For example the compounds of the formula (IV) listed in Table 5 below can also be prepared analogously to Example (IV-1).



(IV)

Table 5 Preparation Examples of the compounds of the formula (IV)

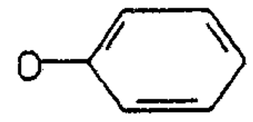
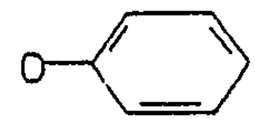
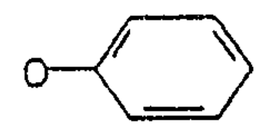
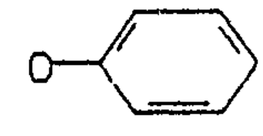
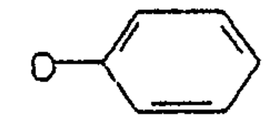
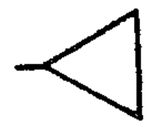
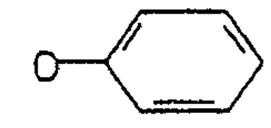
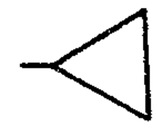
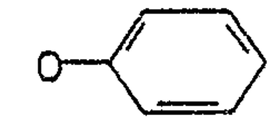
Ex. No.	R^1	R^2	n	Z	Melting point (°C)
IV-2	CH_3	CH_3	0		166
IV-3	CH_3	C_2H_5	0		112
IV-4	C_2H_5	C_2H_5	0		
IV-5	CH_3	C_3H_7	0	Cl	
IV-6	CH_3	CH_2-CH=CH_2	0		
IV-7		CH_3	0		143
IV-8		C_2H_5	0		84
IV-9		C_3H_7	0		

Table 5 (Continuation)

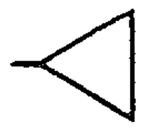
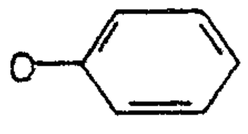
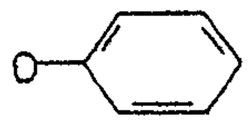
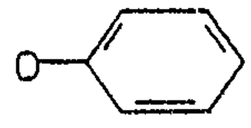
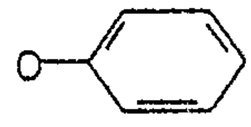
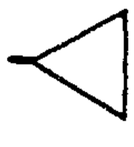
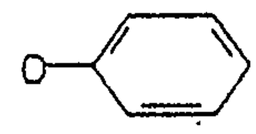
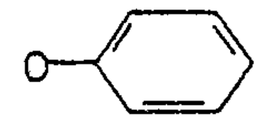
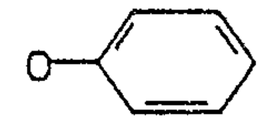
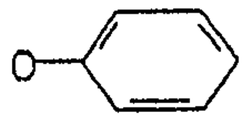
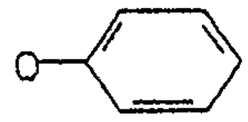
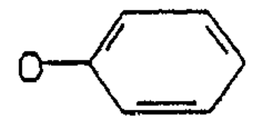
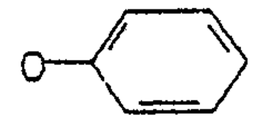
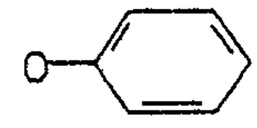
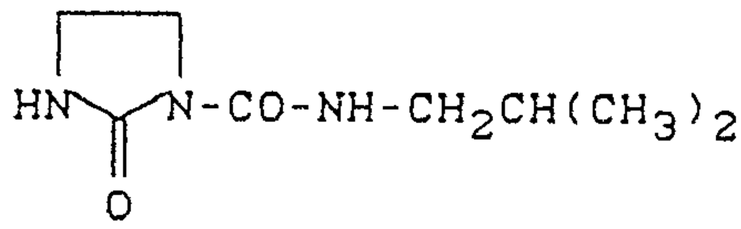
Ex. No.	R^1	R^2	n	Z	Melting point (°C)
IV-10		CH_2-CH=CH_2	O		
IV-11	OCH_3	CH_3	O		
IV-12	OC_2H_5	C_2H_5	O		
IV-13	OCH_2-CH=CH_2	C_2H_5	O		
IV-14		$CH(CH_3)_2$	O	Cl	
IV-15	C_2H_5	CH_3	O	Cl	
IV-16	C_2H_5	C_3H_7	O		
IV-17	NH-CH_3	CH_3	O		
IV-18	NH-CH_3	C_2H_5	O		

Table 5 (Continuation)

Ex. No.	R^1	R^2	n	Z	Melting point (°C)
IV-19	$N(CH_3)_2$	C_2H_5	O		
IV-20	$NH-CH_3$	C_3H_7	O		
IV-21	$NH-CH_3$	$CH(CH_3)_2$	O		
IV-22	$NH-CH_3$	$CH_2-CH=CH_2$	O		
IV-23	$CH_2-CH=CH_2$	C_2H_5	O		

Use Examples:

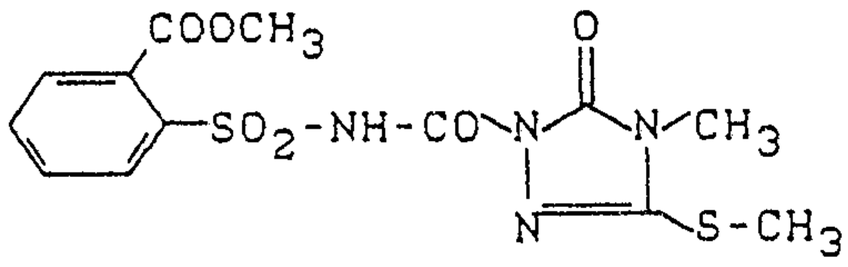
In the Use Examples which follow, the known herbicide isocarbamid, of the formula (A) below, is used as comparison substance:



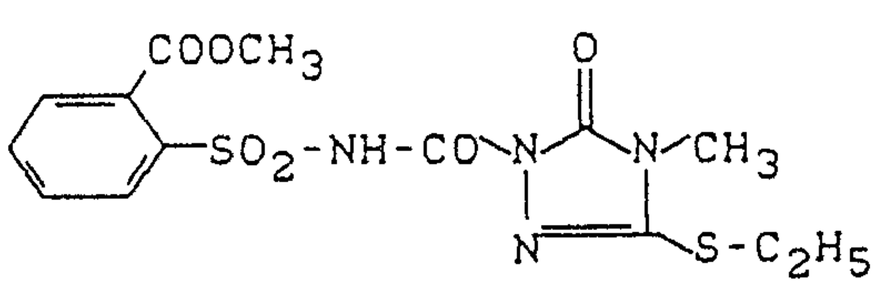
(A)

(disclosed in, for example, DE-1,795,117).

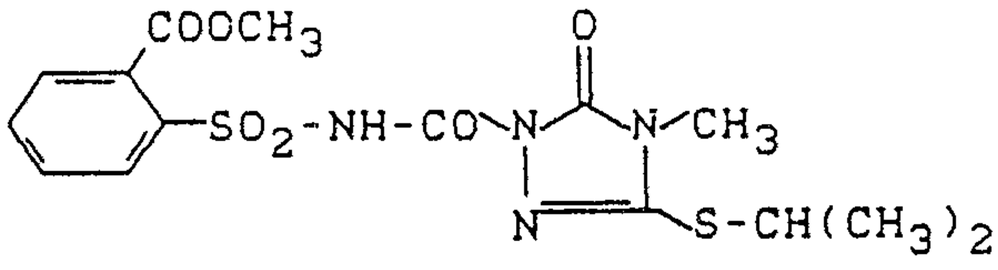
In the text below, the formulae of the compounds according to the invention used for the Use Examples are listed individually, the numbers being those of the Preparation Examples:



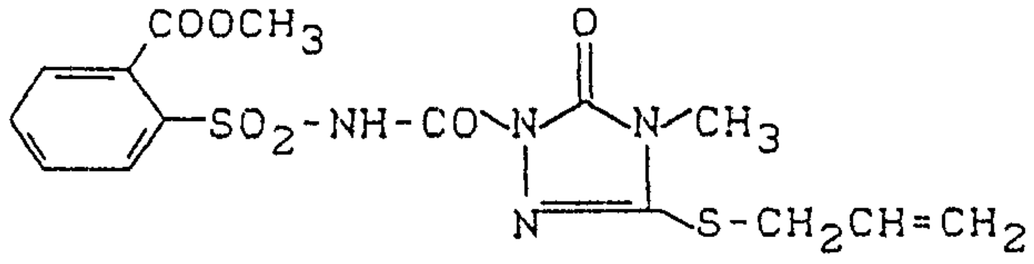
(1)



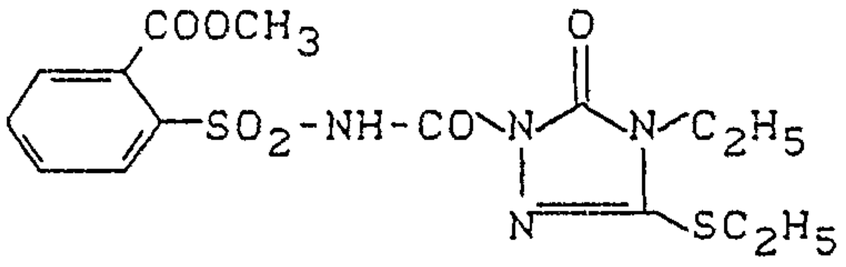
(3)



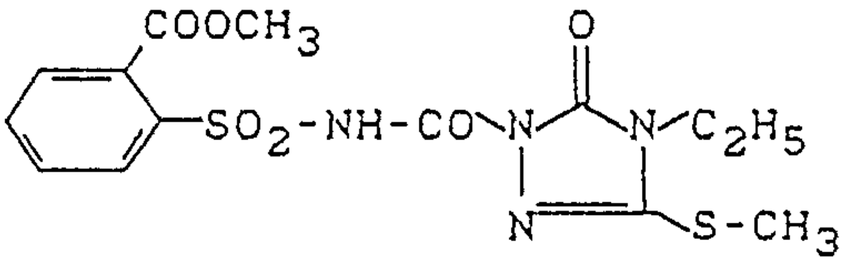
(4)



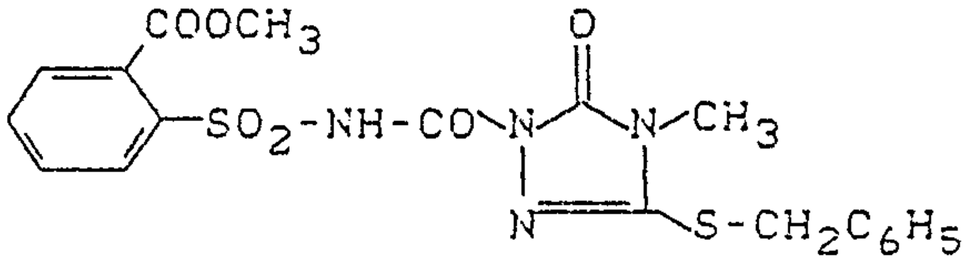
(5)



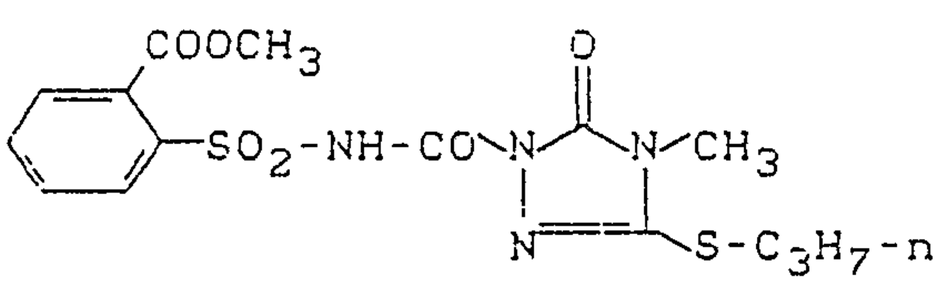
(6)



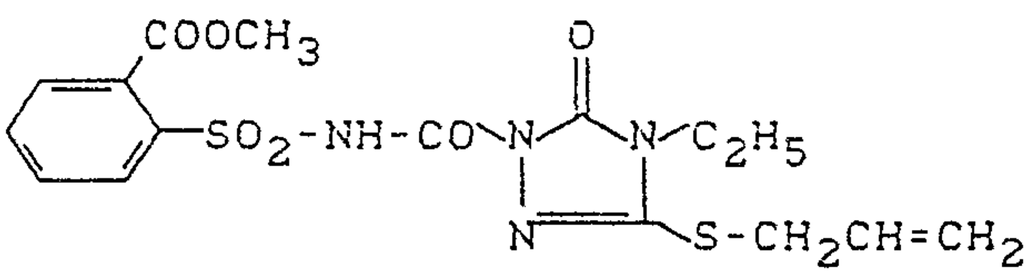
(7)



(9)



(13)



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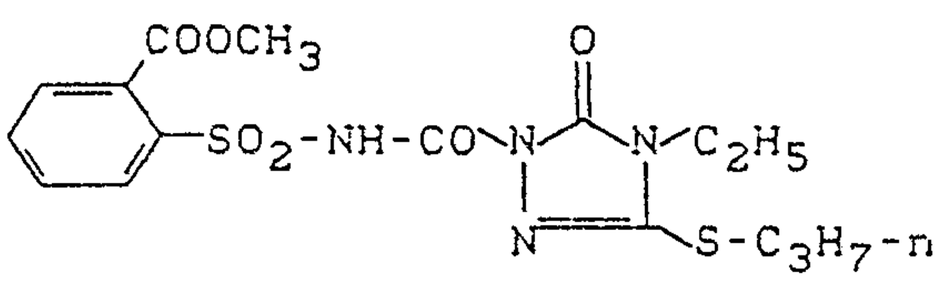
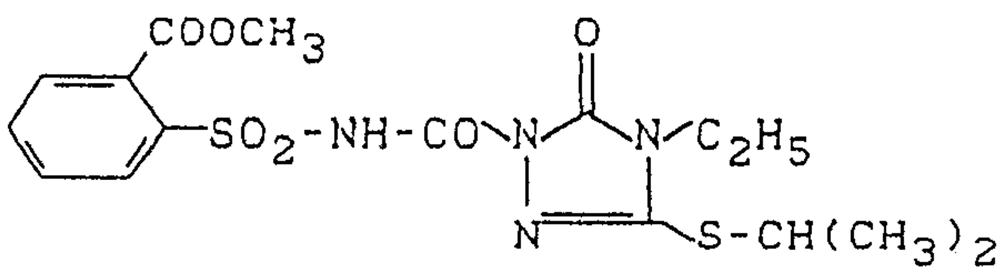


(15)



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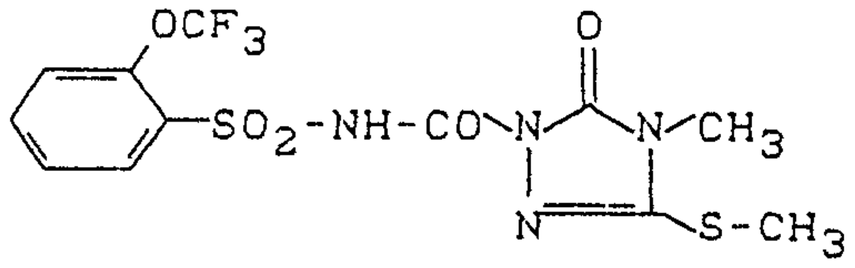

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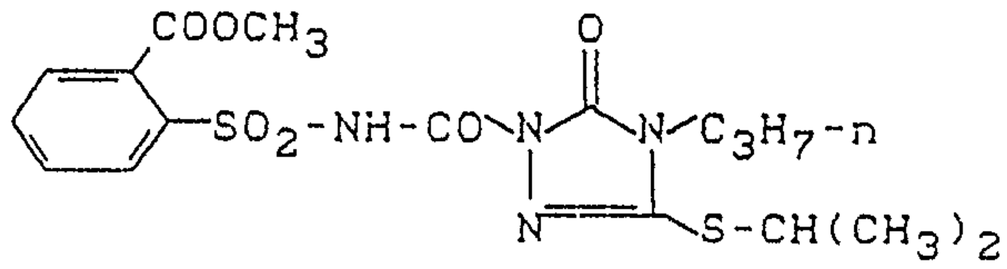

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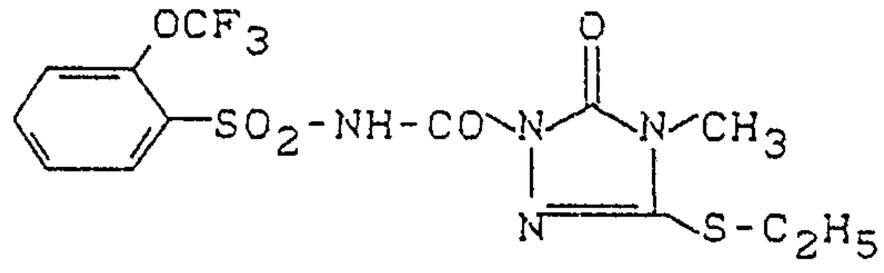

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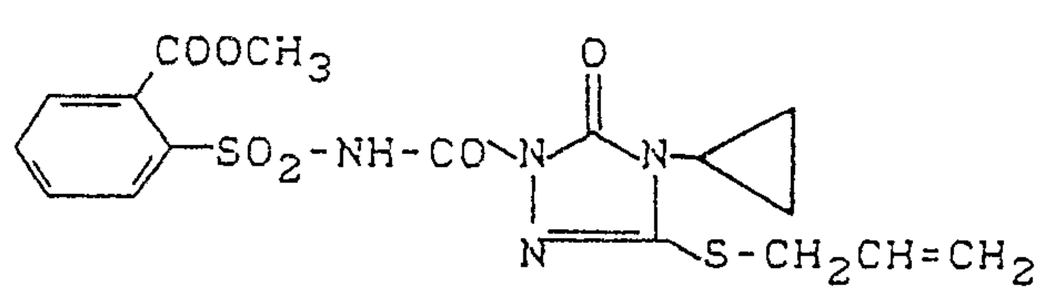

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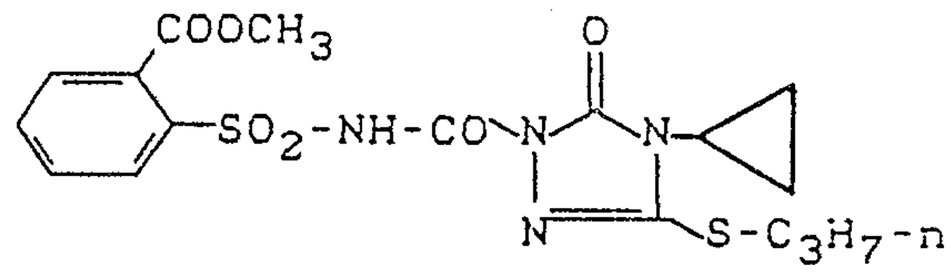

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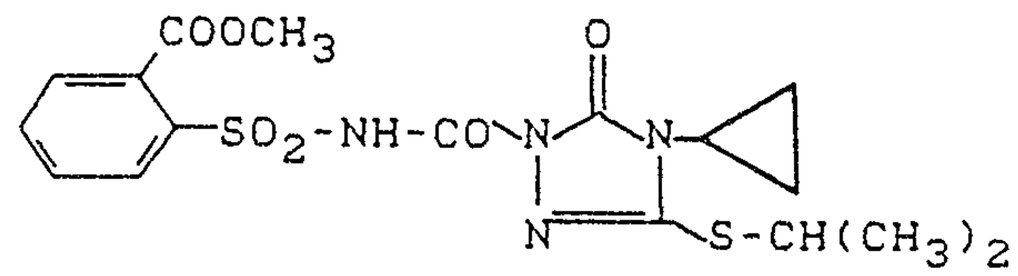

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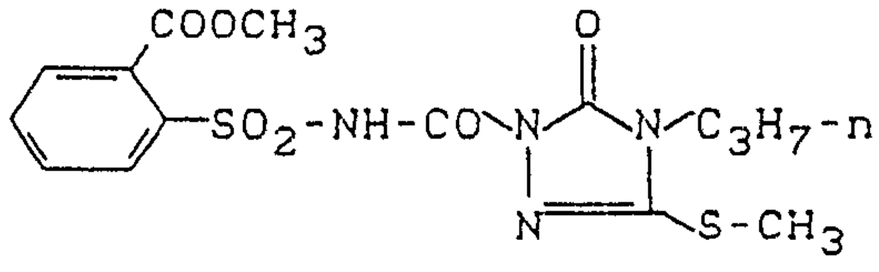

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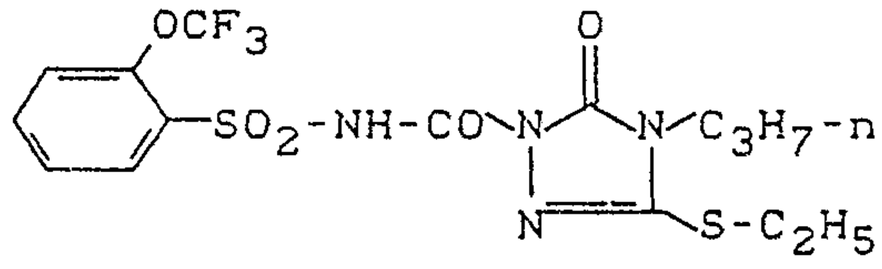

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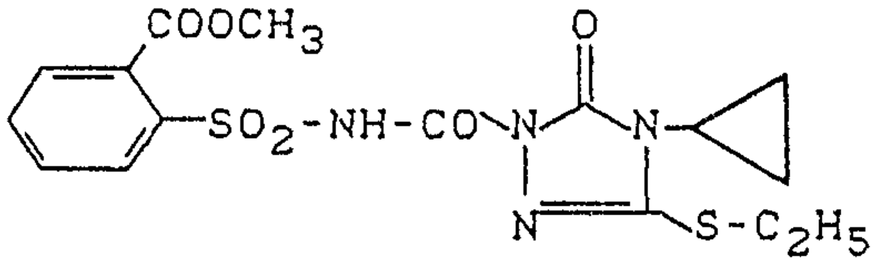

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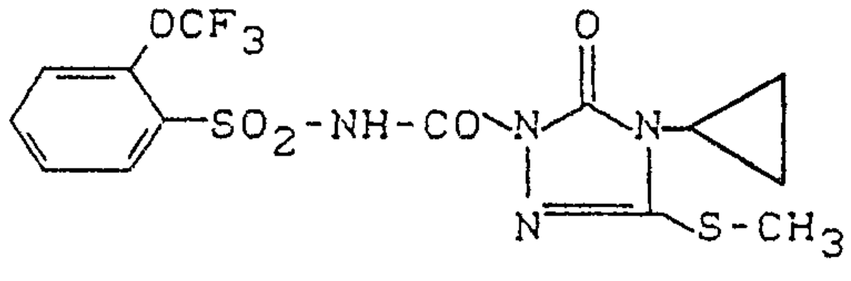

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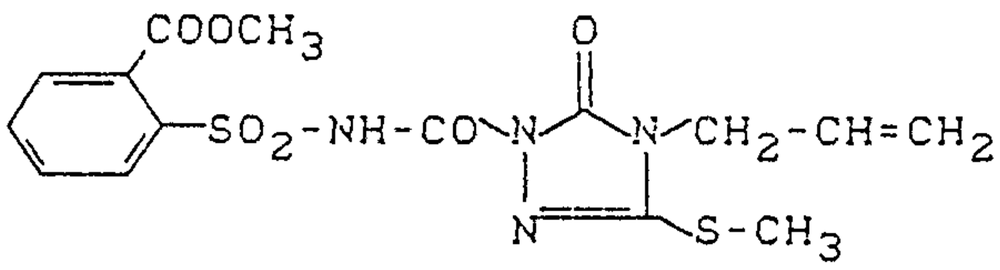

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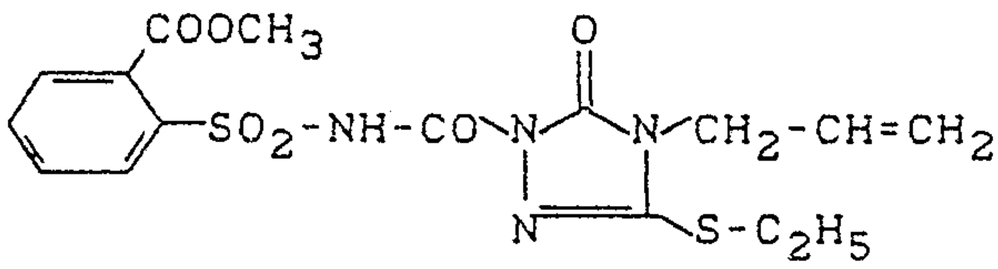

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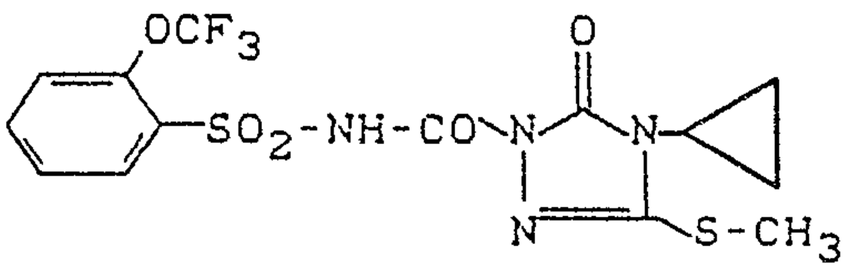

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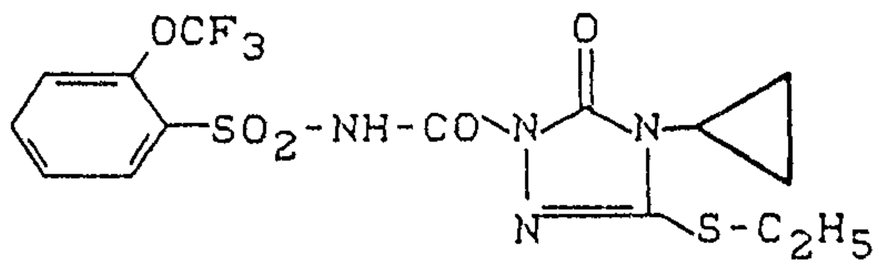

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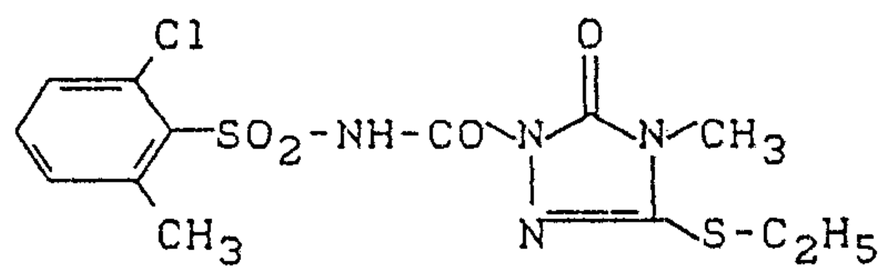

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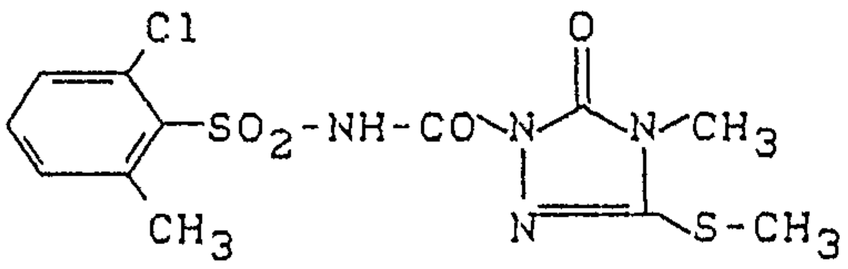

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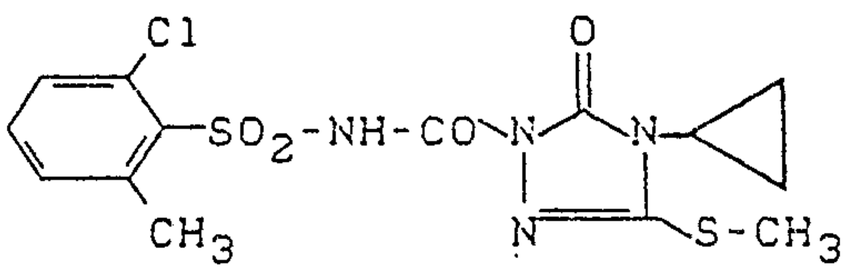

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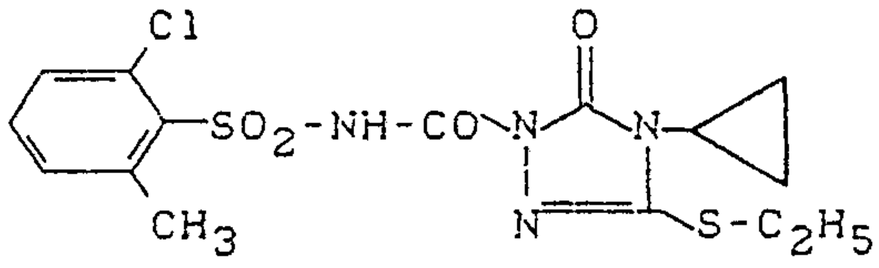

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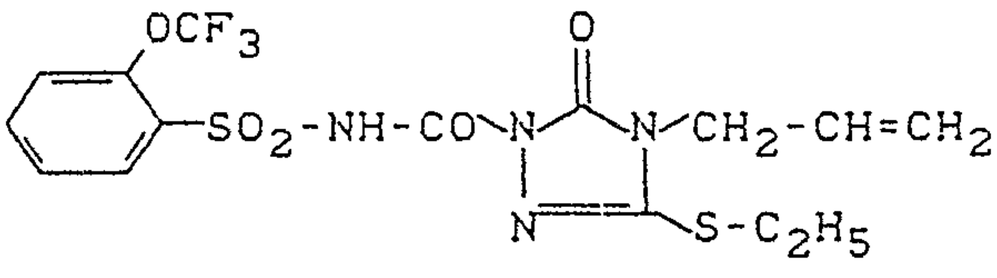


(40)

Example A

Pre-emergence test

Solvent: 5 parts by weight of acetone
Emulsifier: 1 part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amount of solvent, the stated amount of emulsifier is added and the concentrate is diluted with water to the desired concentration.

Seeds of the test plants are sown in normal soil and, after 24 hours, watered with the preparation of the active compound. It is expedient to keep the amount of water per unit area constant. The concentration of the active compound in the preparation is of no importance, only the amount of active compound applied per unit area being decisive. After three weeks, the degree of damage to the plants is rated in % damage in comparison to the development of the untreated control. The figures denote:

0 % = no action (like untreated control)
100 % = total destruction

In this test, a clearly superior activity compared with the prior art is shown, for example, by the compounds of Preparation Examples:
1, 3, 4, 5, 6, 7, 13, 17, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 37.

Example B

Post-emergence test

Solvent: 5 parts by weight of acetone
Emulsifier: 1 part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amount of solvent, the stated amount of emulsifier is added and the concentrate is diluted with water to the desired concentration.

Test plants which have a height of 5 - 15 cm are sprayed with the preparation of the active compound in such a way as to apply the particular amounts of active compound desired per unit area. The concentration of the spray liquor is so chosen that the particular amounts of active compound desired are applied in 1,000 l of water/ha. After three weeks, the degree of damage to the plants is rated in % damage in comparison to the development of the untreated control. The figures denote:

0% = no action (like untreated control)
100% = total destruction

In this test, a clearly superior activity compared with the prior art is shown, for example, by the compounds of Preparation Examples:
1, 3, 4, 5, 6, 7, 13, 14, 16, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 37, 38, 40.

Example C

Pyricularia test (rice) / protective

Solvent: 12,5 parts by weight of acetone
Emulsifier: 0,3 parts by weight of alkylarylpolyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amount of solvent, and the concentrate is diluted with water and the stated amount of emulsifier, to the desired concentration.

To test for protective activity, young rice plants are sprayed with the preparation of active compound until dripping wet. After the spray coating has dried off, the plants are inoculated with an aqueous spore suspension of Pyricularia orycae. The plants are then placed in a greenhouse at 100 % relative atmospheric humidity and 25°C.

Evaluation of the disease infestation is carried out 4 days after the inoculation.

In this test, a clearly superior activity compared with the prior art is shown, for example, by the compounds according to the following preparation examples:
1, 3, 4, 5, 7, 9.

Example D

Pyricularia test (rice) / systemic

Solvent : 12,5 parts by weight of acetone
Emulsifier: 0,3 parts by weight of alkylarylpolyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amount of solvent, and the concentrate is diluted with water and the stated amount of emulsifier, to the desired concentration.

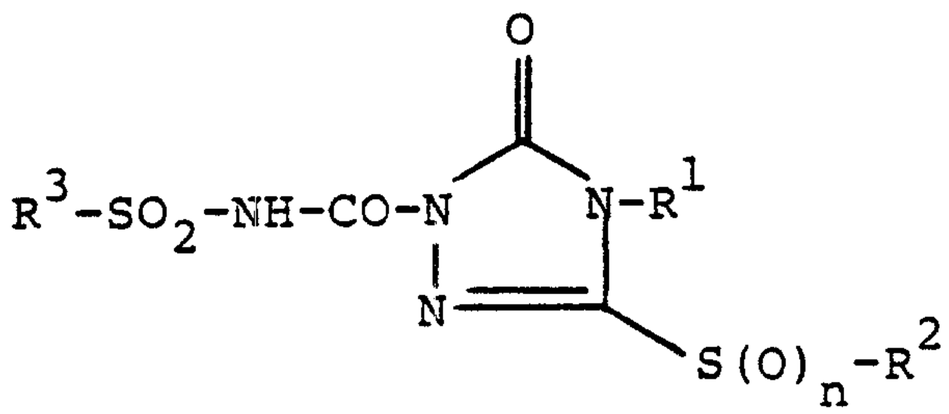
To test for systemic properties, standard soil in which young rice plants have been grown is watered with 40 ml of the preparation of active compound. 7 days after the treatment, the plants are inoculated with an aqueous spore suspension of Pyricularia oryzae.
Thereafter, the plants remain in a greenhouse at a temperature of 25° and a relative atmospheric humidity of 100 % until they are evaluated.
Evaluation of the disease infestation is carried out 4 days after the inocualtion.

In this test, a clearly superior activity compared with the prior art is shown, for example, by the compounds according to the following preparation examples:
1, 3, 4, 5, 7, 15, 17, 21, 22, 25.

23189-7163

CLAIMS:

1. A compound of the general formula (I),



(I)

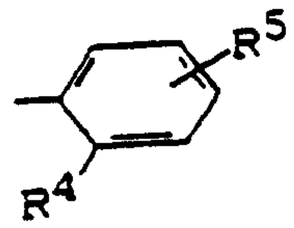
in which

n represents the numbers 0, 1 or 2,

R^1 represents hydrogen, hydroxyl or amino, or represent C_1-C_6-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1-C_4-alkoxy, C_1-C_4-alkylcarbonyl or C_1-C_4-alkoxycarbonyl, or represents C_3-C_6-alkenyl or C_3-C_6-alkinyl, each of which is optionally substituted by fluorine, chlorine and/or bromine, or represents C_3-C_6-cycloalkyl which is optionally substituted by fluorine, chlorine, bromine and/or C_1-C_4-alkyl, or represents phenyl-C_1-C_3-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1-C_4-alkyl, trifluoromethyl, C_1-C_4-alkoxy and/or C_1-C_4-alkoxycarbonyl, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1-C_4-alkyl, trifluoromethly, C_1-C_4-alkoxy, fluorine- and/or chlorine-substituted C_1-C_3-alkoxy, C_1-C_4-alkylthio, fluorine- and/or chlorine-substituted C_1-C_3-alkylthio, C_1-C_4-alkylsulphinyl, C_1-C_4-alkylsulphonyl and/or C_1-C_4-alkoxycarbonyl, or represents C_1-C_6-alkoxy which is optionally substituted by fluorine, chlorine, cyano, phenyl, C_1-C_4-alkoxy or C_1-C_4-alkoxycarbonyl, or represents C_3-C_4-

alkenyloxy, or represents C_1-C_4-alkylamino which is optionally substituted by fluorine, cyano, C_1-C_4-alkoxy or C_1-C_4-alkoxy-carbonyl, or represents C_3-C_6-cycloalkylamino or di-(C_1-C_4-alkyl)-amino,

R^2 represents C_1-C_6-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy or C_1-C_4-alkoxycarbonyl, or represents C_3-C_6-alkenyl or C_3-C_6-alkinyl, each of which is optionally substituted by fluorine, chlorine and/or bromine, or represents C_3-C_6-cycloalkyl which is optionally substituted by fluorine, chlorine, bromine and/or C_1-C_4-alkyl, or represents cyclohexenyl, or represents phenyl-C_1-C_3-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1-C_4-alkyl, trifluoromethyl, C_1-C_4-alkoxy and/or C_1-C_4-alkoxycarbonyl, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1-C_4-alkyl, trifluoromethyl, C_1-C_4-alkoxy, fluorine- and/or chlorine-substituted C_1-C_3-alkoxy, C_1-C_4-alkylthio, fluorine- and/or chlorine-substituted C_1-C_3-alkylthio, C_1-C_4-alkyl-sulphinyl, C_1-C_4-alkylsulphonyl and/or C_1-C_4-alkoxycarbonyl, and

R^3 represents the group  where

R^4 and R^5 are identical or different and represent hydrogen, fluorine, chlorine, bromine, iodine, nitro, C_1-C_6-alkyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1-C_4-alkoxycarbonyl, C_1-C_4-alkylamino-carbonyl, di-(C_1-C_4-alkyl)amino-carbonyl, hydroxyl,

C_1-C_4-alkoxy, formyloxy, C_1-C_4-alkyl-carbonyloxy, C_1-C_4-alkoxy-carbonyloxy, C_1-C_4-alkylamino-carbonyloxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl, C_1-C_4-alkylsulphonyl, di-(C_1-C_4-alkyl)-aminosulphonyl, C_3-C_6-cycloalkyl or phenyl), or represent C_2-C_6-alkenyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1-C_4-alkoxy-carbonyl, carboxyl or phenyl), or represent C_2-C_6-alkinyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1-C_4-alkoxy-carbonyl, carboxyl or phenyl), or represent phenoxy or C_1-C_4-alkoxy (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1-C_4-alkoxy-carbonyl, C_1-C_4-alkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl or C_1-C_4-alkylsulphonyl), or represent C_1-C_4-alkylthio (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1-C_4-alkoxy-carbonyl, C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl or C_1-C_4-alkylsulphonyl), or represent C_3-C_6-alkenyl-oxy (which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1-C_4-alkoxy-carbonyl), or represent C_2-C_6-alkenylthio (which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1-C_3-alkylthio or C_1-C_4-alkoxycarbonyl), C_3-C_6-alkinyloxy or C_3-C_6-alkinylthio, or represent the radical $-C(O)_p-R^6$ where

p represents the number 1 or 2 and

R^6 represents C_1-C_4-alkyl (which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1-C_4-alkoxycarbonyl), C_3-C_6-alkenyl, C_3-C_6-alkinyl, C_1-C_4-alkoxy, C_1-C_4-alkoxy-C_1-C_4-alkylamino, C_1-C_4-alkylamino, di-(C_1-C_4-alkyl)-amino N-methoxy-N-methylamino, methoxyamino, or phenyl, or represents the radical $-NHOR^7$ where

23189-7163

R^7 represents C_1-C_{12}-alkyl (which is optionally substituted by fluorine, chlorine, cyano, C_1-C_4-alkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl, C_1-C_4-alkylsulphonyl, C_1-C_4-alkylcarbonyl, C_1-C_4-alkoxycarbonyl, C_1-C_4-alkyl-amino-carbonyl or di-(C_1-C_4-alkyl)-amino-carbonyl), or represent C_3-C_6-alkenyl (which is optionally substituted by fluorine, chlorine or bromine), C_3-C_6-alkinyl, C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyl-C_1-C_2-alkyl, phenyl-C_1-C_2-alkyl (which is optionally substituted by fluorine, chlorine, nitro, cyano, C_1-C_4-alkyl, C_1-C_4-alkoxy or C_1-C_4-alkoxycarbonyl), or represents benzhydryl, or represents phenyl (which is optionally substituted by fluorine, chlorine, nitro, cyano, C_1-C_4-alkyl, trifluoromethyl, C_1-C_4-alkoxy, C_1-C_2-fluoroalkoxy, C_1-C_4-alkylthio, trifluoromethylthio or C_1-C_4-alkoxycarbonyl),

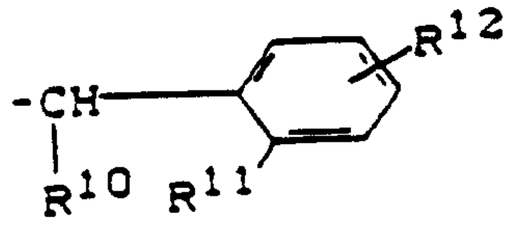
R^4 and/or R^5 furthermore represent phenyl or phenoxy, or represent C_1-C_4-alkylcarbonylamino, C_1-C_4-alkoxycarbonylamino, C_1-C_4-alkylamino-carbonylamino or di-(C_1-C_4-alkyl)-amino-carbonylamino, or represent the radical -CO-R^8 where

R8 represents C_1-C_6-alkyl, C_1-C_6-alkoxy, C_3-C_6-cycloalkoxy, C_3-C_6-alkenyloxy, C_1-C_4-alkylthio, C_1-C_4-alkylamino, C_1-C_4-alkoxyamino, C_1-C_4-alkoxy-C_1-C_4-alkyl-amino or di-(C_1-C_4-alkyl)-amino (each of which is optionally substituted by fluorine and/or chlorine).

R^4 and/or R^5 furthermore represent trimethylsilyl, thiazolinyl, C_1-C_4-alkylsulphonyloxy or di-(C_1-C_4-alkyl)-aminosulphonylamino, or represent the radical -CH=N-R^9 where

R^9 represents C_1-C_6-alkyl which is optionally substituted by fluorine, chlorine, cyano, carboxyl, C_1-C_4-alkoxy, C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl or C_1-C_4-alkylsulphonyl, or represents benzyl which is optionally substituted by fluorine or chlorine, or represents C_3-C_6-alkenyl or C_3-C_6-alkinyl, each of which is optionally substituted by fluorine or chlorine, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, C_1-C_4-alkyl, C_1-C_4-alkoxy, trifluoromethyl, trifluoromethoxy or trifluoromethylthio, or represents C_1-C_6-alkoxy, C_3-C_6-alkenoxy, C_3-C_6-alkinoxy, or benzyloxy, each of which is optionally substituted by fluorine and/or chlorine, or represents amino, C_1-C_4-alkylamino, di-(C_1-C_4-alkyl)-amino, phenyl-amino, C_1-C_4-alkyl-carbonylamino, C_1-C_4-alkoxy-carbonylamino or C_1-C_4-alkyl-sulphonylamino, or represents phenylsulphonylamino which is optionally substituted by fluorine, chlorine, bromine or methy,

furthermore

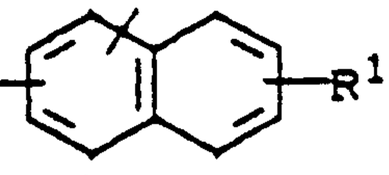
R^3 represents the radical  where

R^{10} represents hydrogen or C_1-C_4-alkyl,

R^{11} and R^{12} are identical or difference and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1-C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1-C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), carboxyl, C_1-C_4-alkoxycarbonyl, dimethylaminocarbonyl, C_1-C_4-alkylsulphonyl or di-(C_1-C_4-alkyl)-aminosulphonyl;

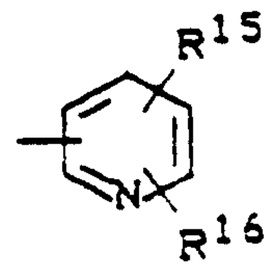
23189-7163

furthermore

R^3 represents the radical  where

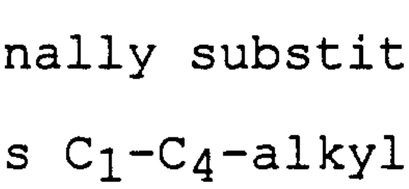
R^{13} and R^{14} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1-C_4-alkyl (which is optionally substituted by fluorine and/or chlorine) or C_1-C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine);

furthermore

R^3 represents the radical  where

R^{15} and R^{16} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1-C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1-C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), or represents C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl or C_1-C_4-alkylsulphonyl (each of which is optionally substituted by fluorine and/or chlorine), or represents aminosulphonyl, mono-(C_1-C_4-alkyl)-aminosulphonyl, or represents di-(C_1-C_4-alkyl)-aminosulphonyl or C_1-C_4-alkoxycarbonyl or dimethylaminocarbonyl;

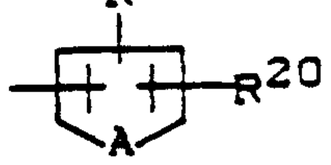
furthermore

R^3 represents the radical  where

R^{17} and R^{18} are identical or different and represent hydrogen, fluorine, chlorine, bromine, C_1-C_4-alkyl (which is optionally substituted by fluorine and/or bromine), C_1-C_4-

alkoxy (which is optionally substituted by fluorine and/or chlorine), or represent C_1-C_4-alkylthio, C_1-C_4-alkylsulphinyl or C_1-C_4-alkylsulphonyl (which is optionally substituted by fluorine and/or chlorine), or represent di-(C_1-C_4-alkyl)-aminosulphonyl;

furthermore

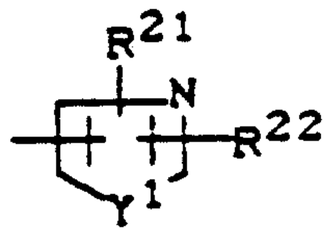
R^3 represents the radical  where

R^{19} and R^{20} are identical or different and represent hydrogen, fluorine, chlorine, bromine, cyano, nitro, C_1-C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1-C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), C_1-C_4-alkylthio, C_1-C_3-alkylsulphinyl or C_1-C_4-alkylsulphonyl (which is optionally substituted by fluorine and/or chlorine), di-(C_1-C_4-alkyl)-aminosulphonyl, C_1-C_4-alkoxycarbonyl or dimethylaminocarbonyl and

A represents oxygen, sulphur or the group N-Z^1 where

Z^1 represents hydrogen, C_1-C_4-alkyl (which is optionally substituted by fluorine, chlorine, bromine or cyano), C_3-C_6-cycloalkyl, benzyl, phenyl (which is optionally substituted by fluorine, chlorine, bromine or nitro), C_1-C_4-alkylcarbonyl, C_1-C_4-alkoxycarbonyl or di-(C_1-C_4-alkyl)-aminocarbonyl;

furthermore

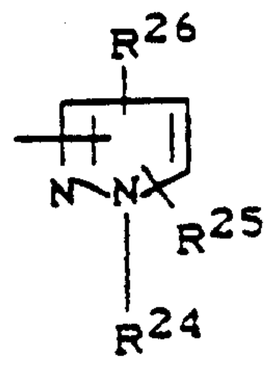
R^3 represent the radical  where

R^{21} and R^{22} are identical or different and represent hydrogen, C_1-C_4-alkyl, halogen, C_1-C_4-alkoxycarbonyl, C_1-C_4-alkoxy or C_1-C_4-halogenoalkoxy,

Y^1 represents sulphur or the group N-R^{23} where

R^{23} represents hydrogen or C_1-C_4-alkyl;

furthermore

R^3 represents the radical  where

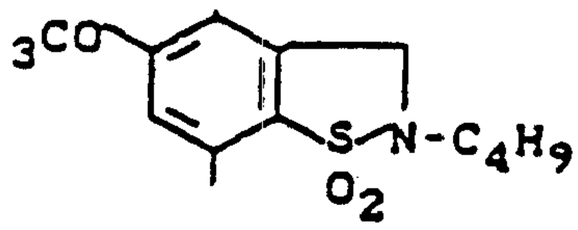
R^{24} represents hydrogen, C_1-C_4-alkyl, benzyl, pyridyl, quinolinyl or phenyl;

R^{25} represents hydrogen, halogen, cyano, nitro, C_1-C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1-C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), dioxolanyl or C_1-C_4-alkoxycarbonyl and

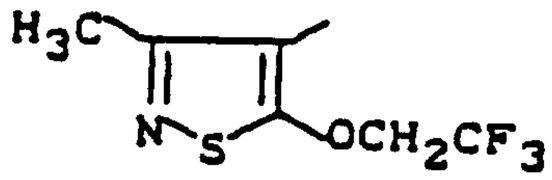
R^{26} represents hydrogen, halogen or C_1-C_4-alkyl;

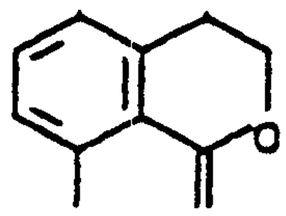
furthermore

R^3 represents one of the groups listed below,



;



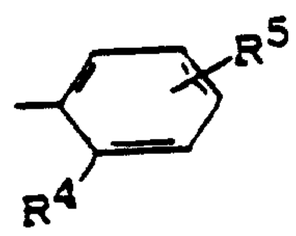


2. A compound according to claim 1 wherein

n represents the number 0, 1 or 2

R^1 represents hydrogen or amino, or represents C_1-C_4-alkyl which is optionally substituted by fluorine, cyano, methoxy or ethoxy, or represents allyl, or represents C_3-C_6-cycloalkyl, or represents benzyl, or represents phenyl, or represents C_1-C_4-alkoxy, or represents C_3-C_4-alkenyloxy, or represents C_1-C_3-alkylamino, C_3-C_6-cycloalkylamino, or represents di-(C_1-C_3-alkyl)-amino,

R^2 represents hydrogen, or represents C_1-C_4-alkyl which is optionally substituted by fluorine and/or chlorine, methoxy or ethoxy, or represents C_3-C_4-alkenyl which is optionally substituted by fluorine and/or chlorine, or represents C_3-C_6-cycloalkyl, or represents benzyl which is optionally substituted by fluorine, chlorine and/or methyl, and

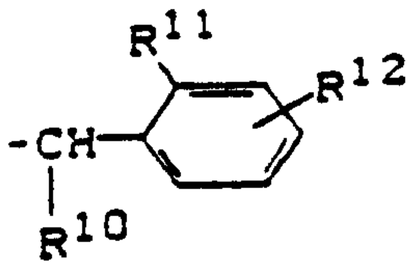
R^3 represents the group  where

R^4 represents fluorine, chlorine, bromine, methyl, trifluoromethyl, methoxy, difluoromethoxy, trifluoromethoxy, 2-

chloro-ethoxy, 2-methoxy-ethoxy, C_1-C_3-alkylthio, C_1-C_3-alkylsulphinyl, C_1-C_3-alkylsulphonyl, dimethylaminosulphonyl, diethylaminosulphonyl, N-methoxy-N-methylamino-sulphonyl, methoxyaminosulphonyl, phenyl, phenoxy or C_1-C_3-alkoxy-carbonyl, and

R^5 represents hydrogen, fluorine, chlorine or bromine,

furthermore

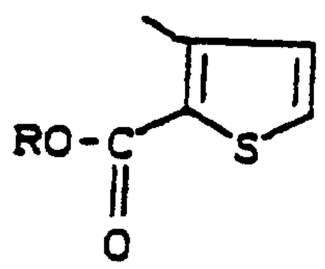
R^3 represents the radical  where

R^{10} represents hydrogen,

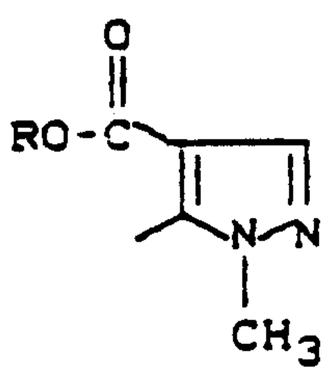
R^{11} represents fluorine, chlorine, bromine, methyl, methoxy, difluoromethoxy, trifluoromethoxy, ethoxy, methoxycarbonyl, ethoxycarbonyl, methylsulphonyl or dimethylaminosulphonyl, and

R^{12} represents hydrogen;

furthermore

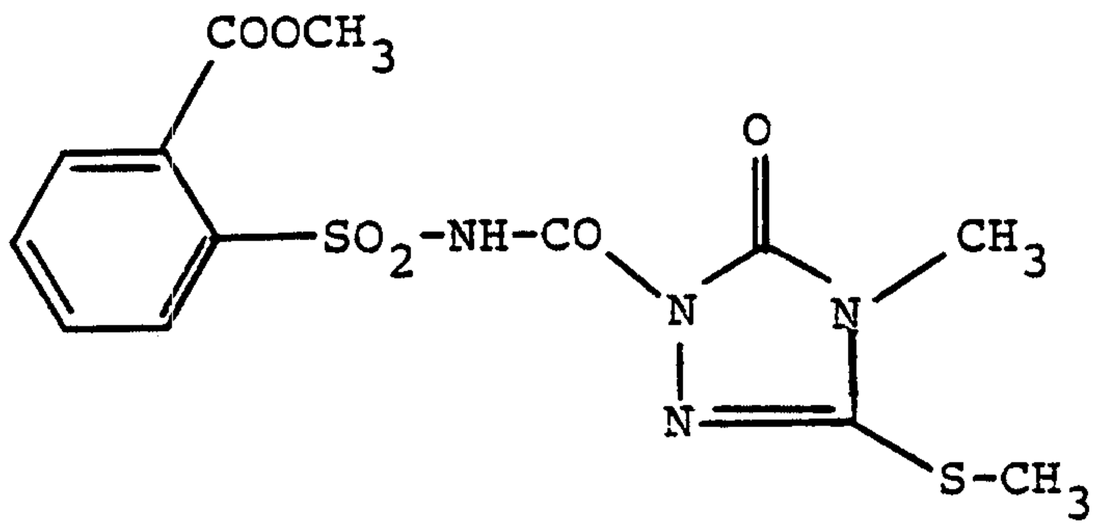
R3 represents the radical 

where R represents C_1-C_4-alkyl, or

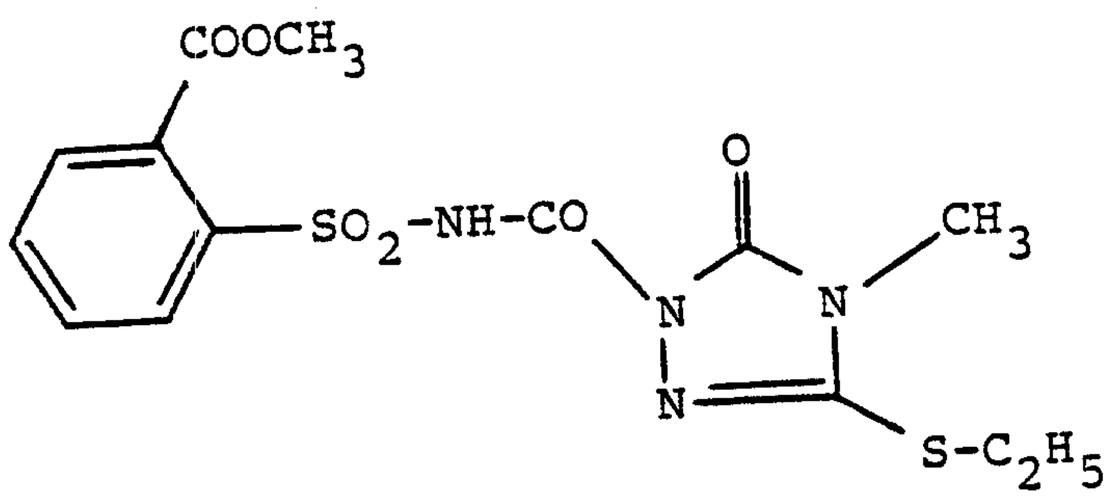
represents the radical 

where R represents C_1-C_4-alkyl.

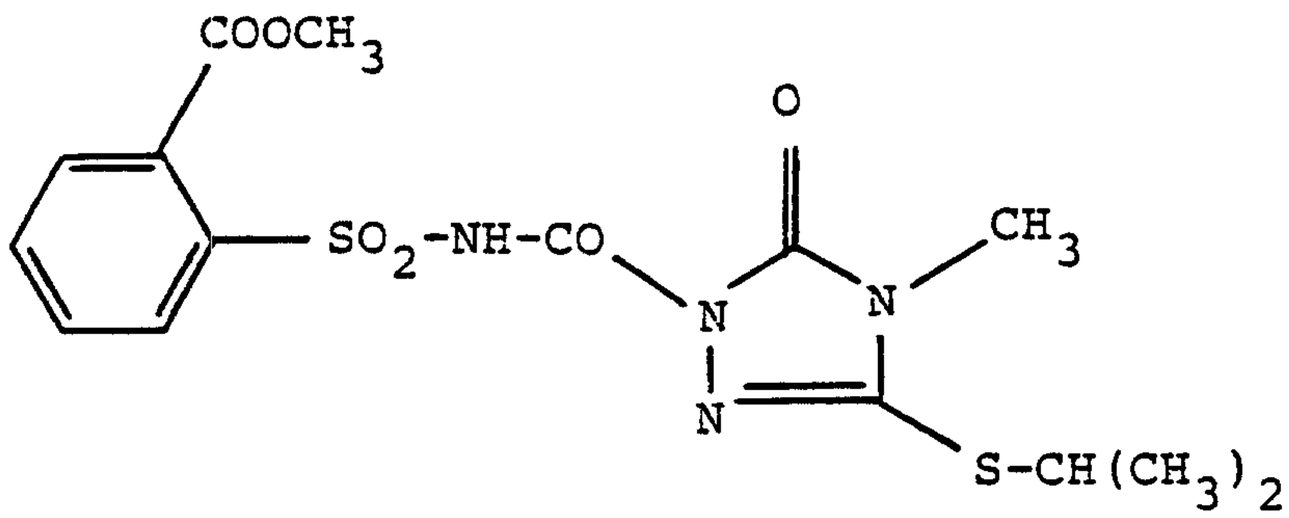
3. A compound of the formula



4. A compound of the formula

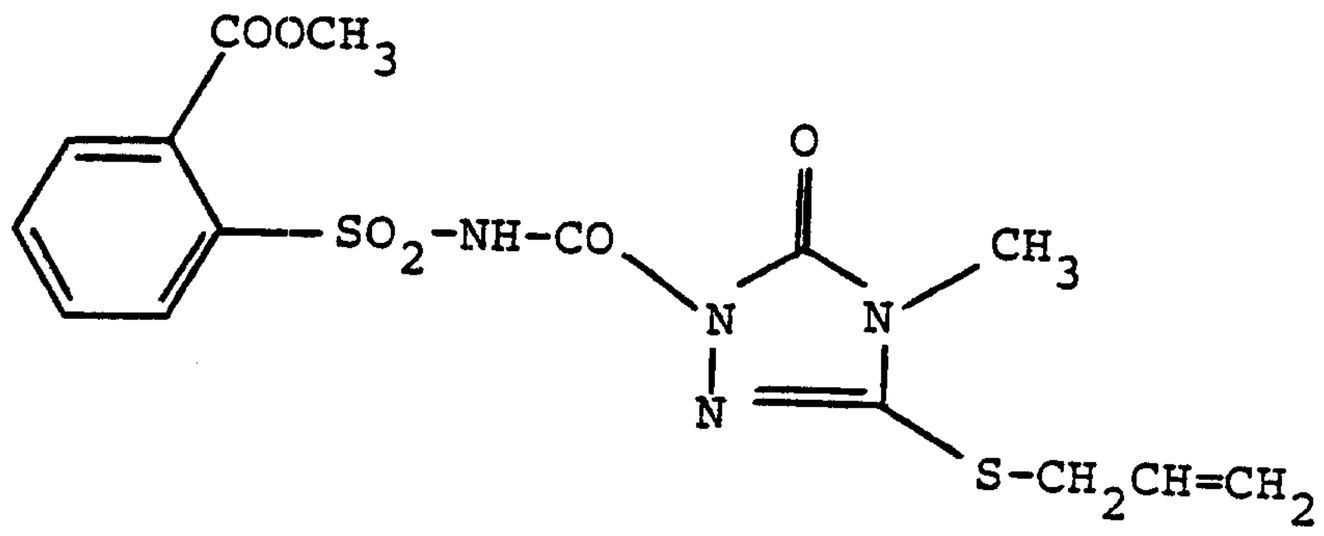


5. A compound of the formula

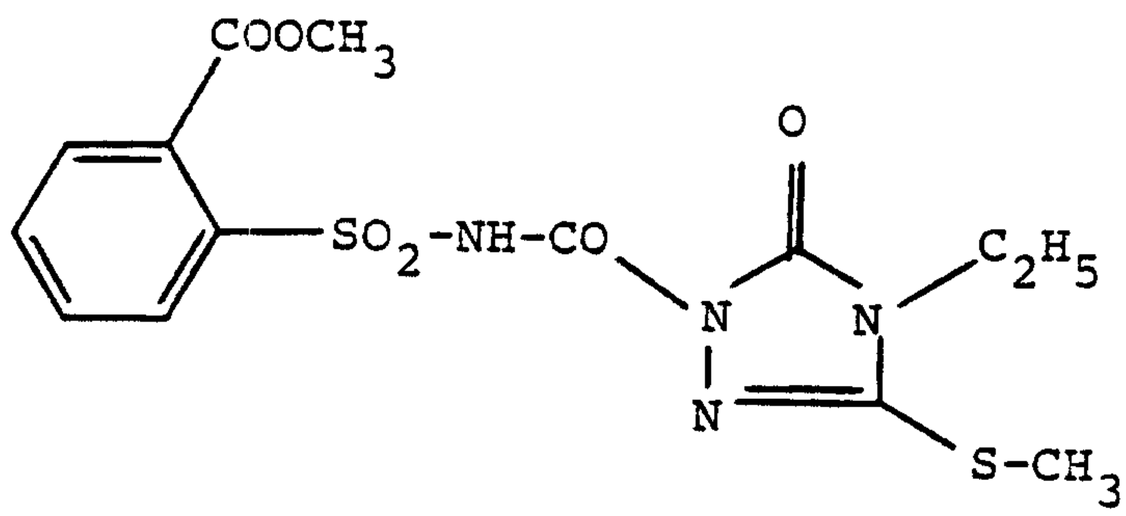


23189-7163

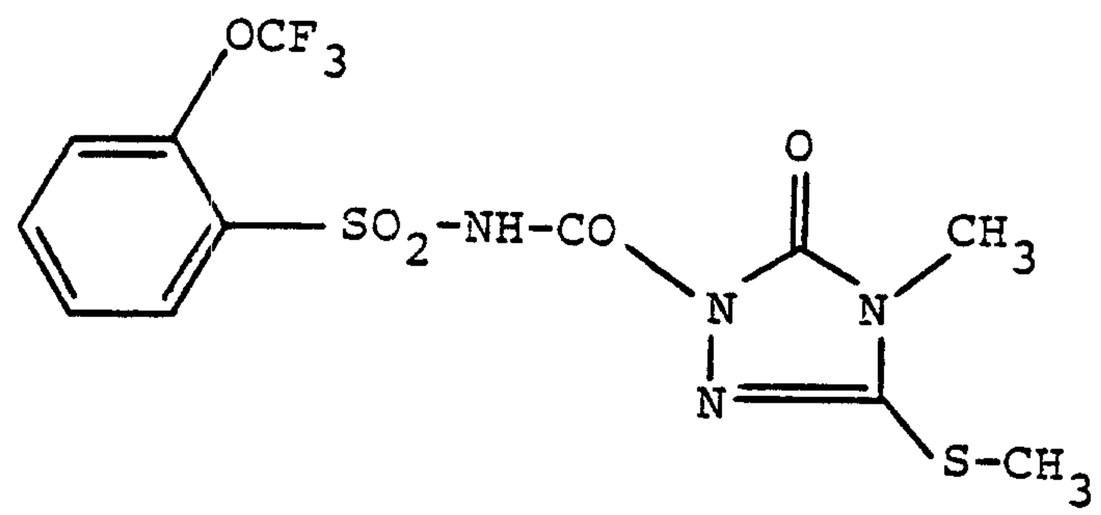
6. A compound of the formula



7. A compound of the formula



8. A compound of the formula



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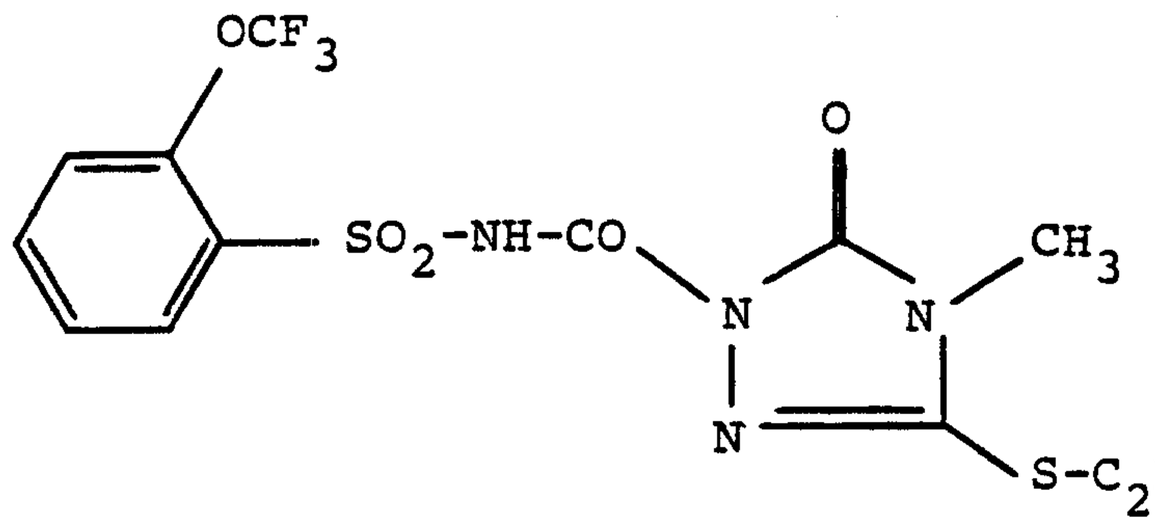
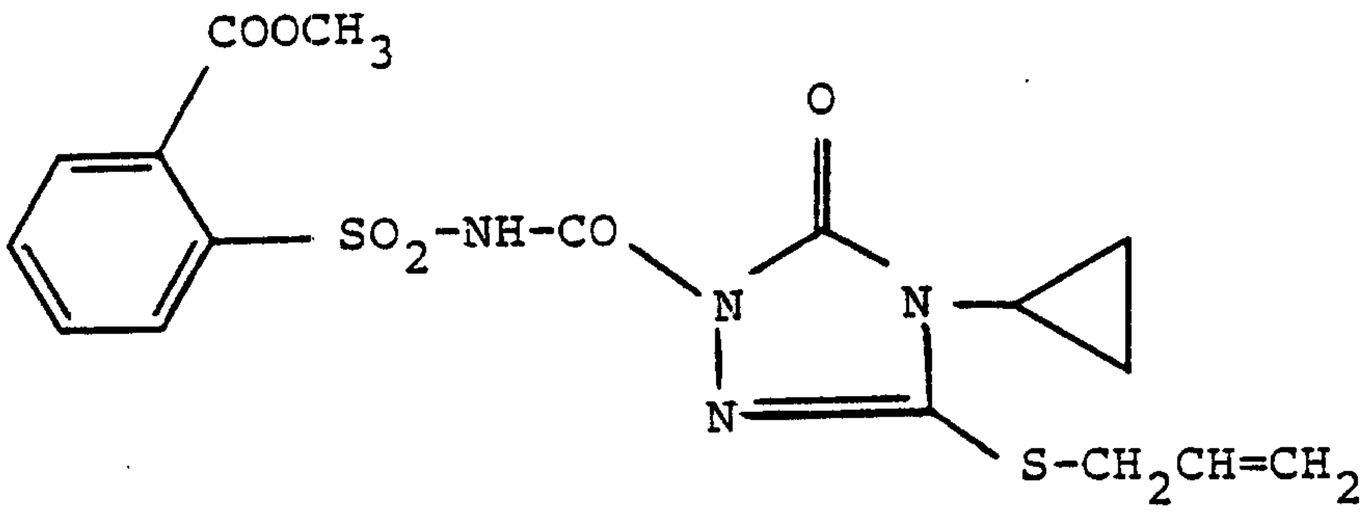
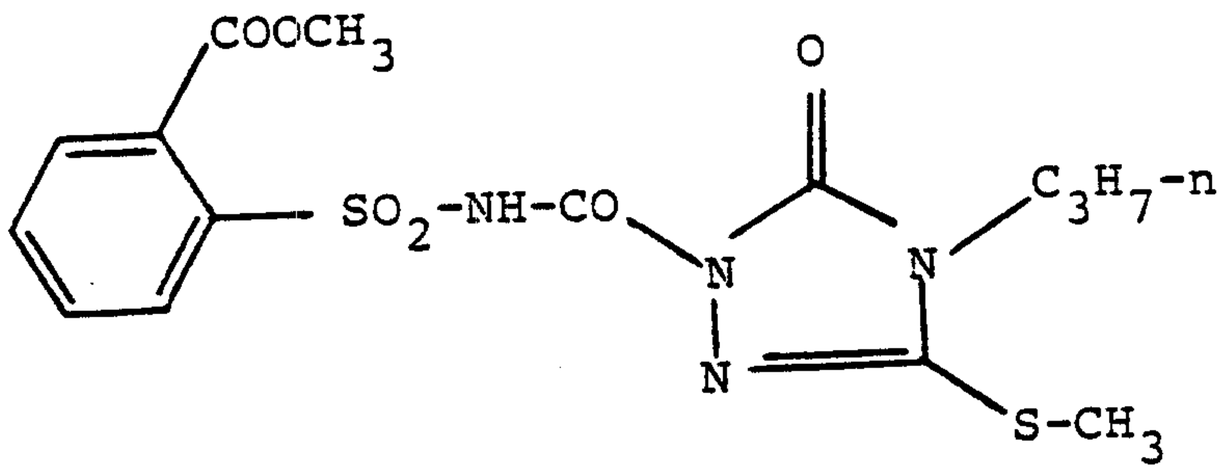
9. A compound of the formula



10. A compound of the formula



11. A compound of the formula



12. A salt of a compound according to any one of claims 1 to 11 wherein the salt is selected from sodium salts, potassium salts, magnesium salts, calcium salts, ammonium salts, C_1-C_4-alkyl-ammonium salts, di-(C_1-C_4-alkyl)-ammonium salts, tri-(C_1-C_4-alkyl)-ammonium salts, C_5- or C_6- cycloalkylammonium salts and di-(C_1-C_2-alkyl)-benzyl-ammonium salts.

13. A herbicidal composition comprising a herbicidally effective amount of a compound according to any one of claims 1 to 11 in admixture with a suitable carrier or diluent.

14. A herbicidal composition comprising a herbicidally effective amount of a compound according to any one of claims 1 to 11 in admixture with an extender or a surface active agent.

15. A method of combating weeds which comprises applying to the weeds, or to a habitat thereof, a herbicidally effective amount of a compound according to any one of claims 1 to 11.

16. A method of combating weeds which comprises applying to the weeds, or to a habitat thereof, a herbicidally effective amount of a composition containing a compound according to any one of claims 1 to 11 in admixture with a suitable carrier or diluent.

17. A method of combating weeds which comprises applying to the weeds, or to a habitat thereof, a herbicidally effective amount of a composition containing between 0.1 and 95% by weight of a compound according to any one of claims 1 to 11 in admixture with a suitable carrier or diluent.

18. A method of combating weeds which comprises applying to the weeds, or to a habitat thereof, a herbicidally effective

amount of a composition containing between 0.5 and 90% by weight of a compound according to any one of claims 1 to 11 in admixture with a suitable carrier or diluent.

19. A method of combating weeds which comprises applying to the weeds, or to a habitat thereof, a herbicidally effective amount of a compound according to any one of claims 1 to 11 wherein the compound is applied as a pre-emergence herbicide.

20. A method of combating weeds which comprises applying to the weeds, or to a habitat thereof, a herbicidally effective amount of a compound according to any one of claims 1 to 11 wherein the compound is applied as a post-emergence herbicide.

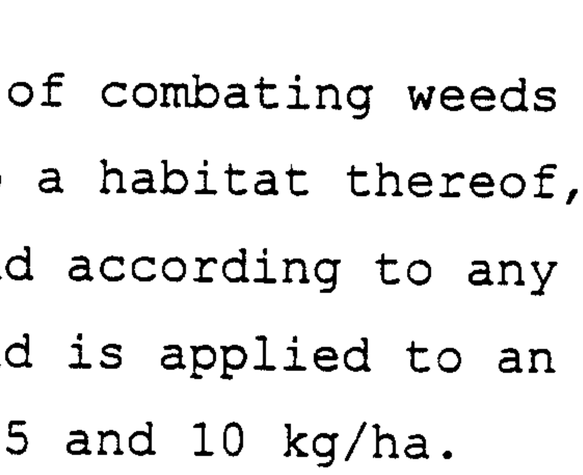
21. A method of combating weeds which comprises applying to the weeds, or to a habitat thereof, a herbicidally effective amount of a compound according to any one of claims 1 to 11 wherein the compound is applied to an area of cultivation at a rate of between 0.01 and 15 kg/ha.

22. A method of combating weeds which comprises applying to the weeds, or to a habitat thereof, a herbicidally effective amount of a compound according to any one of claims 1 to 11 wherein the compound is applied to an area of cultivation at a rate of between 0.05 and 10 kg/ha.

23. A process for preparing a compound of the general formula (I) according to claim 1, which process comprises

a) reacting a triazolinone of the general formula

(II)



(II)

23189-7163

in which

n, R^1 and R^2 have the meanings indicated in claim 1,

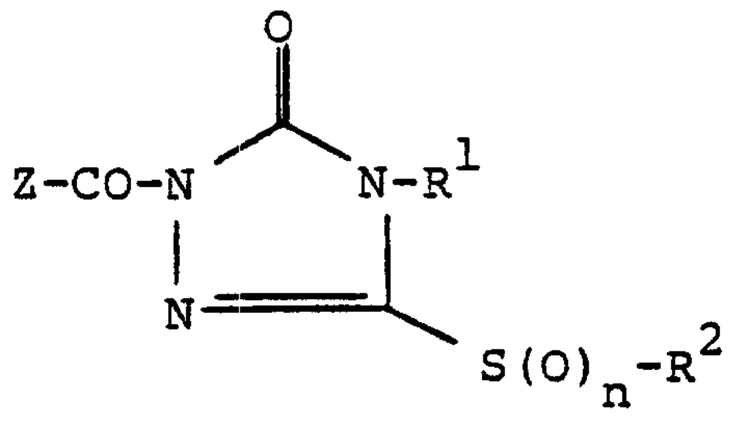
with a sulphonyl isocyanate of the general formula (III)

$$R^3-SO_2-N=C=O \qquad (III)$$

in which

R^3 has the meaning indicated in claim 1, or

b) reacting a triazolinone derivative of the general formula (IV)



(IV)

in which

n, R^1 and R^2 have the meanings indicated in claim 1

and

Z represents chlorine, C_1-C_4-alkoxy, benzyloxy or phenoxy, with a sulphonamide of the general formula (V)

$$R^3-SO_2-NH_2 \qquad (V)$$

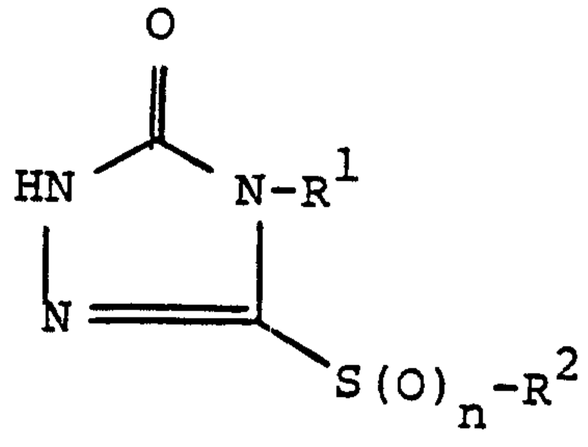
in which

R^3 has the meaning indicated in claim 1, or

c) reacting a triazolinone of the general formula

(II)

23189-7163



(II)

in which

n, R^1 and R^2 have the meanings indicated in claim 1,

with a sulphonamide derivative of the general formula (VI)

$$R^3\text{-}SO_2\text{-}NH\text{-}CO\text{-}Z \qquad \text{(VI)}$$

in which

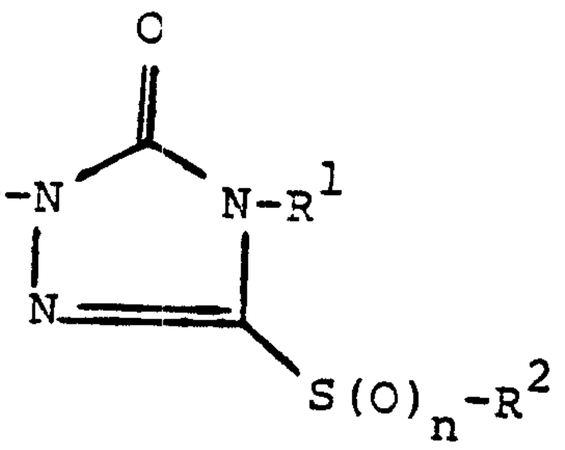
R^3 has the meaning indicated in claim 1 and

Z represents chlorine, C_1-C_4-alkoxy, benzyloxy or phenoxy, and where required, forming a salt thereof.

24. A process according to claim 23 wherein Z represent methoxy or phenoxy.

25. A process for preparng a herbicidal composition which process comprises admixing a sulphonylaminocarbonyltriazolinone of the general formula (I) according to claim 1 with a carrier and/or surface-active agent.

26. A compound of the general formula (IV)



(IV)

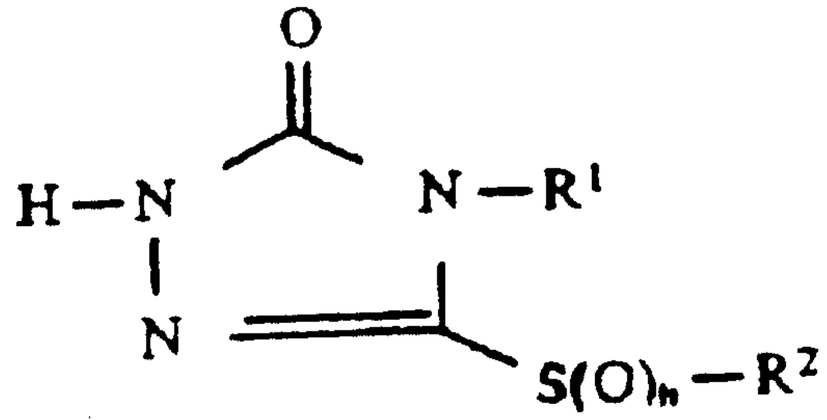
in which

n, R^1 and R^2 are as defined in claim 1, 2 or 3 and

Z represents chlorine, C_1-C_4-alkoxy, benzyloxy or phenoxy.

27. A compound according to claim 26 wherein Z represents methoxy or phenoxy.

28. A compound of the formula



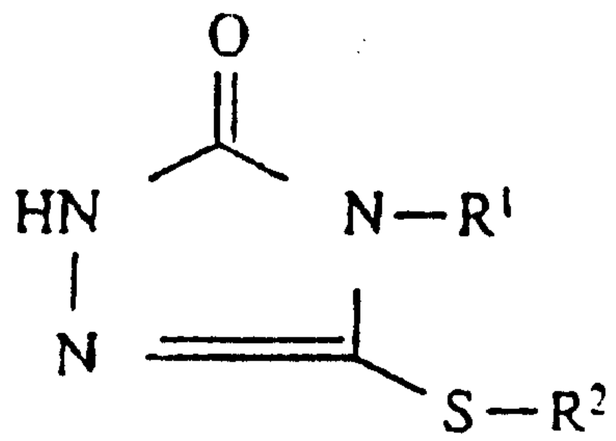
in which

n is 0 (zero),

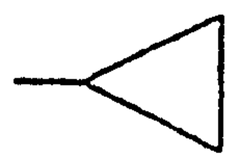
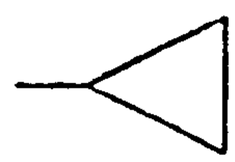
R^1 is NH-CH_3, and

R^2 is CH_3, C_2H_5, C_3H_7, $CH(CH_3)_2$ or CH_2-CH=CH_2.

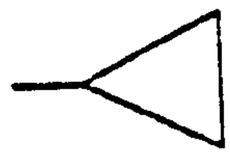
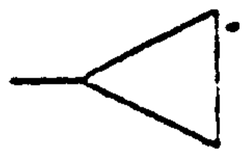
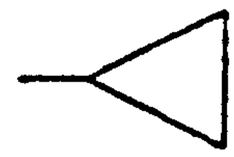
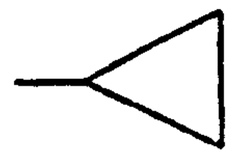
29. A compound of the formula



in which R^1 is and R^2 is

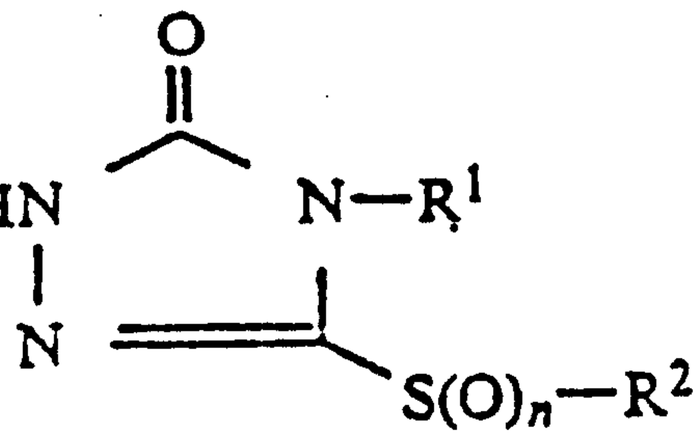
(a)		CH_3
(b)		C_2H_5

23189-7163

(c)		C_3H_7
(d)		$CH(CH_2)_2$
(e)		$CH_2-CH=CH_2$
(f)	$CH_2-CH=CH_2$	C_2H_5
(g)	$CH_2-CH=CH_2$	$CH_2-CH=CH_2$
(h)	$CH_2-CH=CH_2$	$CH(CH_3)_2$
(i)	$CH_2-CH=CH_2$	C_3H_7
(j)		$CH_2-C\equiv CH$
(k)	$CH_2-CH=CH_2$	$CH_2-C\equiv CH$
(l)	OCH_3	CH_3
(m)	OCH_3	C_2H_5
(n)	OC_2H_5	CH_3
(o)	OC_2H_5	C_2H_5
(p)	OC_3H_7-n	$CH_2-CH=CH_2$
(q)	$OCH_2-CH=CH_2$	C_2H_5

23189-7163

30. A compound of the formula

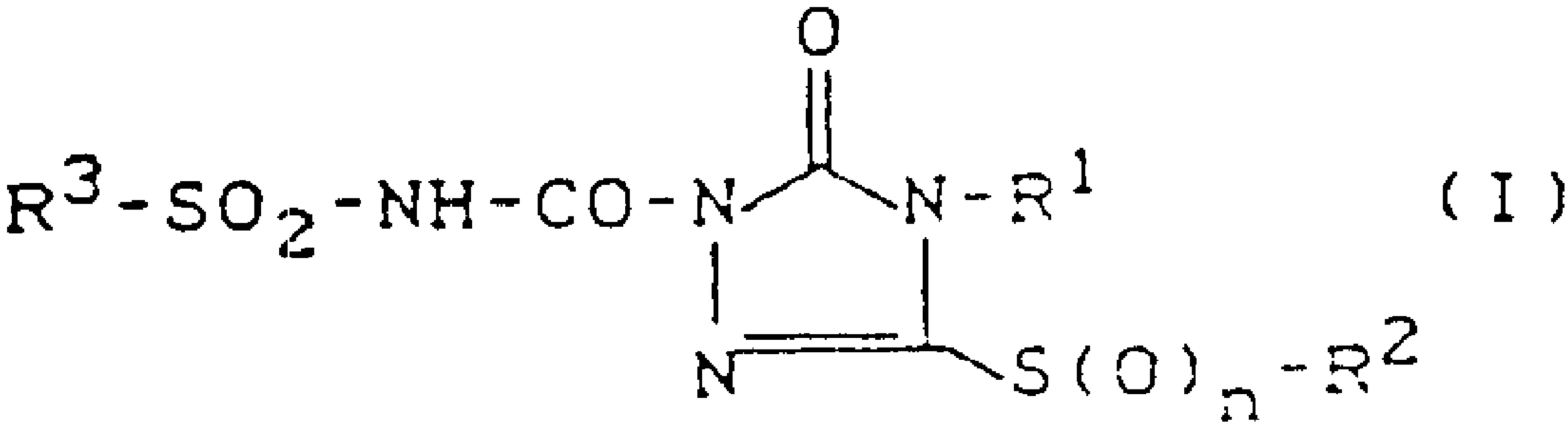


in which

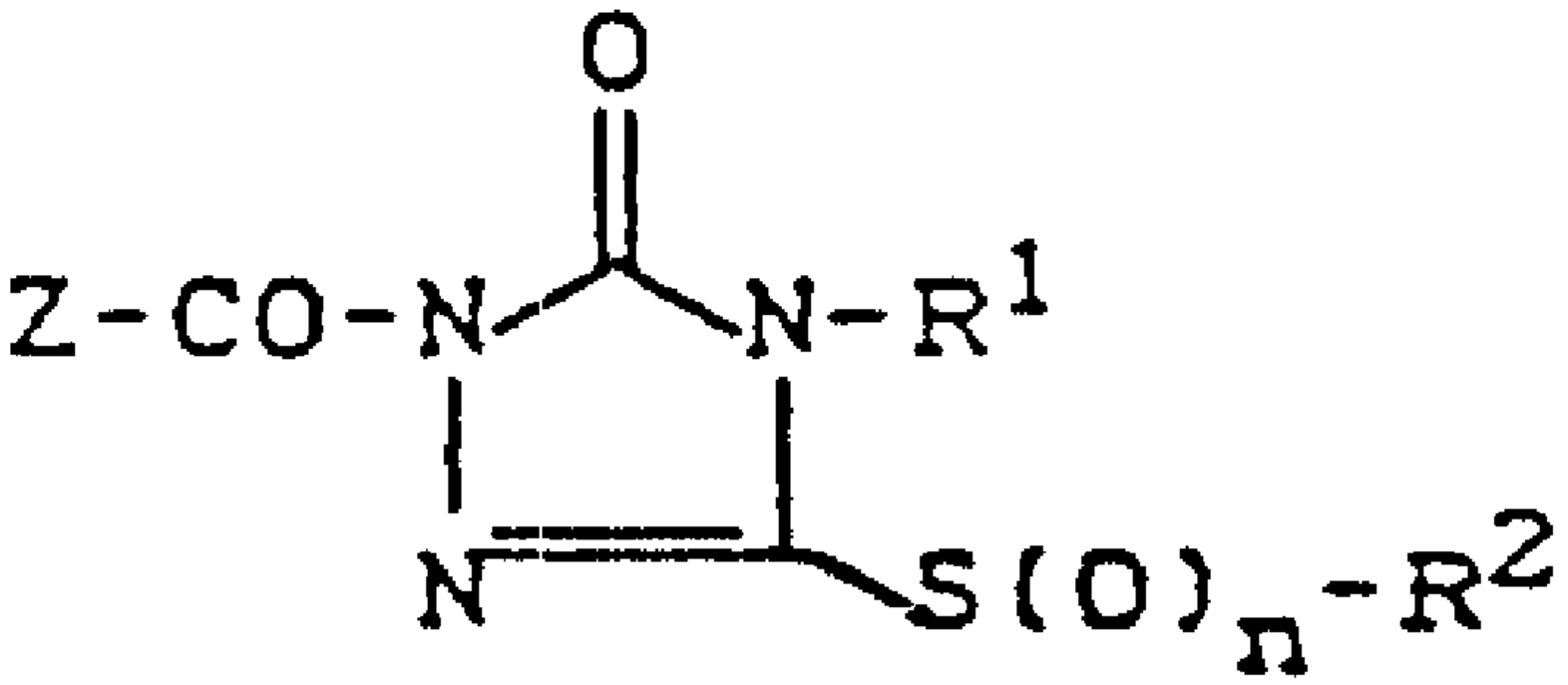
n represents the number 0, 1, or 2,

R^1 represents di-(C_1-C_4-alkyl)-amino, and

R^2 represents C_1-C_6-alkyl.



(I)



(IV)