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Phenylsulphonyl ureas, processes for their preparation and their use as herbicides and plant-growth regulators

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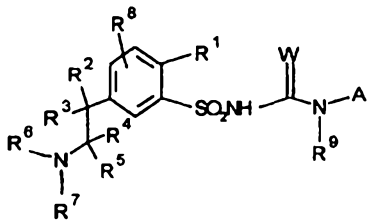
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(54) Title: PHENYLSULPHONYL UREAS, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS HERBICIDES AND PLANT-GROWTH REGULATORS

(54) Bezeichnung: PHENYLSULFONYLHARNSTOFFE, VERFAHREN ZU IHRER HERSTELLUNG UND IHRE VERWENDUNG ALS HERBIZIDE UND PFLANZENWACHSTUMSREGULATOREN

(57) Abstract

The invention concerns compounds of formula (I) and their salts, in the formula R^1–R^9, W and A being defined as in formula (I) according to claim 1. These compounds and salts are suitable as herbicides and plant-growth regulators. They can be prepared by processes according to claim 5 using intermediate products according to claim 9, some of which are novel.



(I)

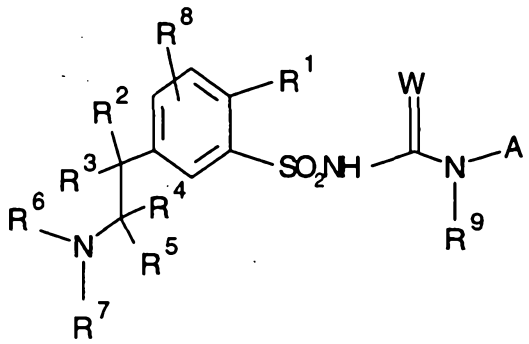
(57) Zusammenfassung

Substituierte Aminomethylphenylsulfonylharnstoffe, Verfahren zu ihrer Herstellung und ihre Verwendung als Herbizide und Pflanzenwachstumsregulatoren. Verbindungen der Formel (I) und deren Salze, worin R^1–R^9, W und A wie in Formel (I) nach Anspruch (1) definiert sind, eignen sich als Herbizide und Pflanzenwachstumsregulatoren. Sie können nach Verfahren gemäß Anspruch (5) über zum Teil neue Zwischenprodukte gemäß Anspruch (9) hergestellt werden.

Abstract

Substituted aminomethylphenylsulfonylureas, processes for their preparation, and their use as herbicides and plant growth regulators

Compounds of the formula (I) and salts thereof



(I)

in which

R^1-R^9, W and A are as defined in formula (I) of claim 1 are suitable as herbicides and plant growth regulators. They can be prepared by processes according to claim 5 via intermediates according to claim 9, some of which are novel.

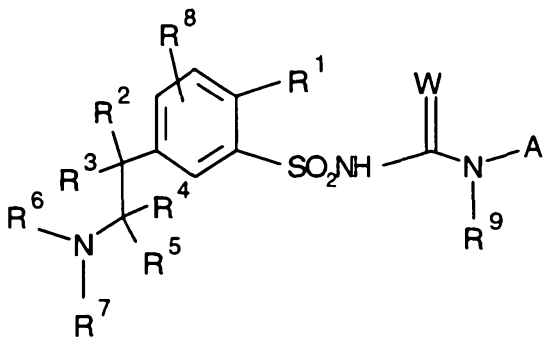
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Phenylsulfonylureas, processes for their preparation, and their use as herbicides and plant growth regulators

It is known that some phenylsulfonylureas have herbidical and plant-growth-regulating properties; cf. US-A-4,786,314, US-A-4,927,453, WO 89/10921 and WO 95/10507 (= ZA 94/8063). However, some of these show disadvantages upon use, such as, for example, high persistence or insufficient selectivity in important crops of useful plants.

There have now been found novel phenylsulfonylureas which have specific radicals on the phenyl ring and which can be employed advantageously as herbicides and plant growth regulators.

The present invention relates to compounds of the formula (I) or salts thereof



(I)

in which

R^1 is an acyl radical of the formula $S(O)_n$-R^{10} or CO-Q-R^{11},

R^2, R^3, R^4, R^5 are identical or different radicals selected from the group consisting of H, (1-6)alkyl, (1-4)alkoxy, (1-4)haloalkyl, (1-4)haloalkoxy and halogen,

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R^6 is H, OH, formyl, a radical of the formula R, R-O-, R-CO, R-O-CO-, R-SO_2-, R-SO- or RR°NSO_2-, in which each of the radicals R and R° is a hydrocarbon radical which is unsubstituted or substituted and, inclusive of substituents, preferably has 1 to 20 carbon atoms,

R^7 is an acyl radical or

NR^6R^7 together are a heterocyclic radical which has 3 to 8 ring atoms and which, besides the nitrogen atom of the group NR^6R^7 as hetero ring atom, optionally has 1 to 3 further hetero ring atoms selected from the group consisting of N, O and S and which is unsubstituted or substituted and, inclusive of substituents, preferably has 2 to 18 carbon atoms and which has at least one electron-attracting group in neighboring position to the nitrogen atom of the group NR^6R^7,

W is an oxygen or sulfur atom,

R^8 is H, (1-6)alkyl, (2-6)alkenyl, (1-6)alkoxy, (1-4)alkylthio, [(1-4)alkyl]carbonyl or [(1-4)alkoxy]carbonyl, each of the six last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio and CN, or is halogen, NO_2, CN, NH_2 or mono- or disubstituted amino,

R^9 is H or (1-6)alkyl,

R^{10} is NH_2, mono- or disubstituted amino or a hydrocarbon radical which is unsubstituted or substituted and which, inclusive of substituents, preferably has 1 to 30 carbon atoms,

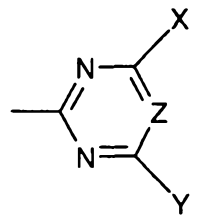
n is the number 0, 1 or 2, with the exception of the case R^{10} = NH_2 or mono- or disubstituted amino, in which case n = 2,

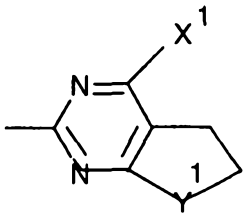
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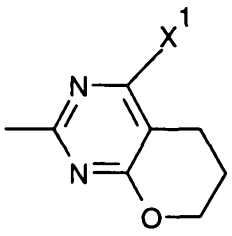
R^{11} is H or a hydrocarbon radical which is unsubstituted or substituted and, inclusive of substituents, preferably has 1 to 30 C atoms, or is a heterocycle which has 3 to 8 ring atoms and which is unsubstituted or substituted and, inclusive of substituents, preferably has 1 to 20 carbon atoms,

Q is an oxygen or sulfur atom or a group of the formula -NR'- in which R' is H or a hydrocarbon radical which is unsubstituted or substituted, or is an acyl radical in which R' is preferably H or has 1 to 10 carbon atoms,

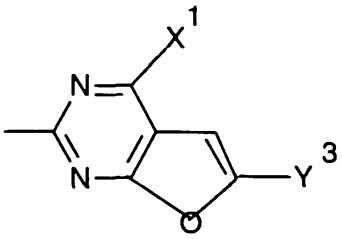
A is a radical of the formula

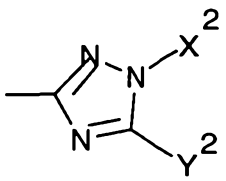


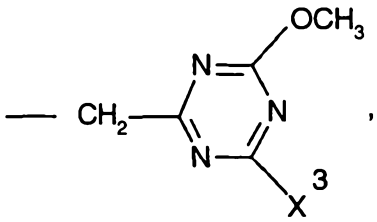
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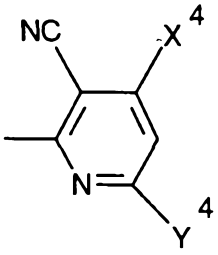
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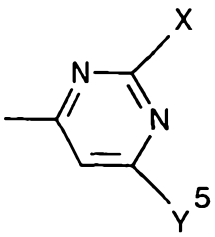


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or


one of the radicals X and Y is hydrogen, halogen, (1-3)alkyl or (1-3)alkoxy, each of the two last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-3)alkoxy and (1-3)alkylthio, and

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the other of the radicals X and Y is hydrogen, halogen, (1-3)alkyl, (1-3)alkoxy or (1-3)alkylthio, each of the three last-mentioned alkyl-containing radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-3)alkoxy and (1-3)alkylthio, or is a radical of the formula NR^aR^b, (3-6)cycloalkyl, (2-4)alkenyl, (2-4)alkynyl, (3-4)alkenyloxy or (3-4)alkynyloxy,

Z is CH or N,

R^a and R^b independently of one another are H, (1-4)alkyl or (2-4)alkenyl,

X^1 is CH_3, OCH_3, OC_2H_5 or $OCHF_2$,

Y^1 is -O- or $-CH_2-$,

X^2 is CH_3, C_2H_5 or CH_2CF_3,

Y^2 is OCH_3, OC_2H_5, SCH_3, SCH_2CH_3, CH_3 or C_2H_5,

X^3 is CH_3 or OCH_3,

Y^3 is H or CH_3,

X^4 is CH_3, OCH_3, OC_2H_5, CH_2OCH_3 or Cl,

Y^4 is CH_3, OCH_3, OC_2H_5 or Cl and

Y^5 is CH_3, C_2H_5, OCH_3 or Cl.

Of greater interest are those compounds of the formula (I) according to the invention and salts thereof in which

R^1 is $S(O)_n$-R^{10} or $COQR^{11}$,

R^2, R^3, R^4, R^5 independently of one another are H or (1-4)alkyl,

R^6 is H, OH, formyl, (1-6)alkyl, (2-6)alkenyl, (2-4)alkynyl, (1-6)alkoxy, (2-6)alkenyloxy, (2-6)alkynyloxy, [(1-6)alkyl]carbonyl, [(2-6)alkenyl]-carbonyl, [(2-6)alkynyl]carbonyl), (1-4)alkylsulfonyl, (2-6)alkenylsulfonyl, (2-6)alkynylsulfonyl, (3-6)cycloalkyl, (5-6)cycloalkenyl, [(3-6)cycloalkyl]-carbonyl, [(5-6)cycloalkenyl]carbonyl, [(3-6)cycloalkyl]sulfonyl, [(5-6)cycloalkenyl]sulfonyl, each of the 18 last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio, (1-4)alkylsulfinyl, (1-4)alkylsulfonyl, [(1-4)alkoxy]carbonyl, [(1-4)alkyl]carbonyl, [(1-4)alkyl]carbonyloxy and CN and, in the case of cyclic radicals, also by (1-4)alkyl and (1-4)haloalkyl,

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or

phenylcarbonyl or phenylsulfonyl, each of the two last-mentioned radicals being unsubstituted or substituted in the phenyl ring by one or more radicals selected from the group consisting of halogen, CN, NO_2, (1-4)alkyl, (1-4)haloalkyl, (1-4)alkoxy and (1-4)haloalkoxy,

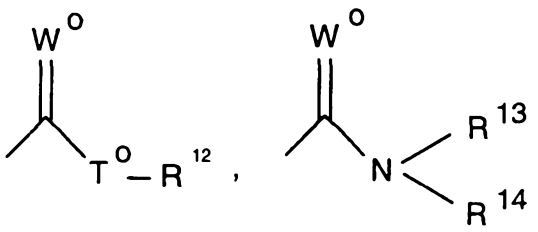
R^7 is CHO, [(1-6)alkyl]carbonyl, [(2-6)alkenyl]carbonyl, [(2-6)alkynyl]-carbonyl, (1-6)alkylsulfonyl, (2-6)alkenylsulfonyl, (2-6)alkynylsulfonyl, [(3-6)cycloalkyl]carbonyl, [(5-6)cycloalkenyl]carbonyl, [(3-6)cycloalkyl]sulfonyl, (5-6)cycloalkenylsulfonyl, each of the 10 last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio, (1-4)alkylsulfonyl, (1-4)alkylsulfinyl, (1-4)alkylcarbonyl, [(1-4)alkoxy]-carbonyl, [(1-4)alkyl]carbonyloxy and CN and, in the case of cyclic radicals, also by (1-4)alkyl and (1-4)haloalkyl,

or

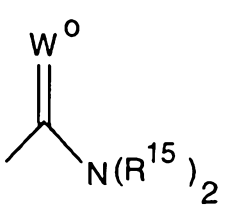
phenylcarbonyl or phenylsulfonyl, each of the two last-mentioned radicals being unsubstituted or substituted in the phenyl ring by one or more radicals selected from the group consisting of halogen, CN, NO_2, (1-4)alkyl, (1-4)haloalkyl, (1-4)alkoxy and (1-4)haloalkoxy,

or

mono- or di[(1-4)alkyl]aminosulfonyl which is unsubstituted or substituted in the alkyl moiety by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio, (1-4)alkylsulfinyl, (1-4)alkylsulfonyl, [(1-4)alkyl]carbonyl, [(1-4)alkyl]carbonyloxy, [(1-4)alkoxy]carbonyl and CN, or a group of the formula COCOR' in which R' = H, OH, (1-4)alkoxy or (1-4)alkyl, or a group of the formula



or



or

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R^6 and R^7 together are a chain of the formula $(-CH_2)_{m1}\ B^1-$ or $-B^1-(CH_2)_{m2}B^2-$, the chain being unsubstituted or substituted by one or more (1-3)alkyl radicals or halogen and m1 is 3, 4 or 5 and m2 is 2, 3 or 4, and

W, W^o are an oxygen atom or a sulfur atom,

B^1,B^2 independently of one another are SO_2 or CO,

Q is O, S or NR^{16},

T^o is an oxygen atom or a sulfur atom,

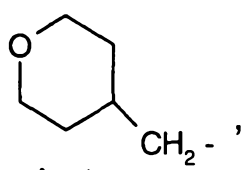
R^8 is H, (1-4)alkyl, (1-4)alkoxy, (1-4)alkylthio, [(1-4)alkyl]carbonyl or [(1-4)alkoxy]carbonyl, each of the last-mentioned 5 radicals being unsubstituted or substituted in the alkyl moiety by one or more halogen atoms, or is halogen, NO_2, CN or mono- or di(1-4)alkylamino,

R^9 is H or CH_3,

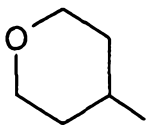
R^{10} is $NR^{17}R^{18}$, (1-6)alkyl, (2-6)alkenyl, (2-6)alkynyl, (3-6)cycloalkyl, (5-6)cycloalkenyl or phenyl, each of the last-mentioned 6 radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, CN, (1-4)alkoxy, (1-4)alkylthio, (1-4)alkylsulfinyl, (1-4)alkylsulfonyl, [(1-4)alkyl]carbonyl, [(1-4)alkoxy]carbonyl and [(1-4)alkyl]carbonyloxy,

n is the number 0, 1 or 2, unless $R^{10} = NR^{17}R^{18}$, in which case n = 2, and

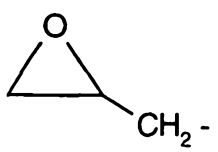
R^{11} is H, (1-6)alkyl, (2-6)alkenyl, (2-6)alkynyl, (3-6)cycloalkyl, (5-6)cycloalkenyl or phenyl, each of the last-mentioned 6 radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, CN, (1-4)alkoxy, (1-4)alkylthio, (1-4)alkylsulfinyl, (1-4)alkylsulfonyl, [(1-4)alkyl]carbonyl, [(1-4)alkoxy]carbonyl and [(1-4)alkyl]carbonyloxy, and, in the case of cyclic radicals, also by (1-4)alkyl and (1-4)haloalkyl, or is a radical of the heterocyclyl or heterocyclyl(1-4)alkyl type which has 3-7 ring atoms, preferably having 1 to 3 hetero ring atoms selected from the group consisting of N, O and S, in particular a radical of the formula A-1 to A-6,



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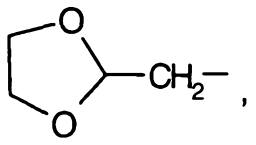


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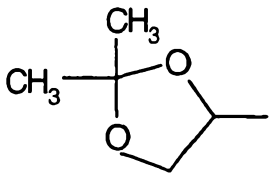


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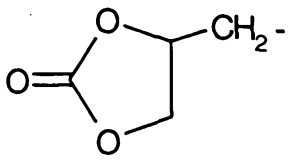
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A - 4



A - 5



A - 6

R^{12} is (1-4)alkyl, (3-4)alkenyl or (3-4)alkynyl, each of the three last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio, [(1-4)alkyl]carbonyl and [(1-4)alkoxy]carbonyl,

R^{13}, R^{14} independently of one another are H, (1-4)alkyl, (3-4)alkenyl oder (3-4)alkynyl, each of the three last-mentioned radicals being unsubstituted or substituted by one or more of the radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio, [(1-4)alkyl]carbonyl and [(1-4)alkoxy]carbonyl,

the radicals R^{15} together with the nitrogen atom are a heterocyclic ring which has 5 or 6 ring members, may contain further hetero atoms selected from the group consisting of N, O and S at the oxidation levels which are possible and which is unsubstituted or substituted by (1-4)alkyl or the oxo group, or which is benzo-fused,

R^{16} is H, (1-4)alkyl, (3-4)alkenyl or (3-4)alkynyl, each of the three last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy and (1-4)alkylthio,

R^{17} is H, (1-4)alkyl or (1-4)alkoxy, and

R^{18} is H or (1-4)alkyl.

Definitions of general radicals with carbon atoms in formula (I) frequently contain ranges or individual data for the number of carbon atoms possible. The indication of a range, or number, of the carbon atoms precedes the name of the general chemical group in brackets; for example, (1-4)alkyl denotes an alkyl radical having 1 to 4 carbon atoms; or (1-4)haloalkyl denotes haloalkyl having 1 to 4 carbon atoms in the alkyl moiety or alkyl skeleton; (1)alkyl equals methyl; the general definition of unsubstituted (3)alkyl thus embraces n-propyl and i-propyl.

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The compounds of the formula (I) may form salts where the hydrogen of the $-SO_2-NH-$ group is replaced by a cation which is suitable for agriculture. Examples of these salts are metal salts, in particular alkali metal salts or alkaline earth metal salts, in particular sodium salts and potassium salts, or else ammonium salts or salts with organic amines. Equally, salt formation may be effected by subjecting an acid to an addition reaction with basic groups, such as, for example, amino and alkylamino. Acids which are suitable for this purpose are strong inorganic and organic acids, for example HCl, HBr, H_2SO_4 or HNO_3.

In formula (I) and all subsequent formulae, the radicals alkyl, alkoxy, haloalkyl, haloalkoxy, alkylamino and alkylthio and the corresponding unsaturated and/or substituted radicals in the carbon skeleton may in each case be straight-chain or branched. Unless specifically indicated, the lower carbon skeletons, e.g. those having 1 to 6 carbon atoms, or, in the case of unsaturated groups, those having 2 to 6 carbon atoms, are preferred amongst these radicals. Alkyl radicals, also in the composite meanings such as alkoxy, haloalkyl and the like, are, for example, methyl, ethyl, n- or i-propyl, n-, i-, t- or 2-butyl, pentyl radicals, hexyl radicals, such as n-hexyl, i-hexyl and 1,3-dimethylbutyl, heptyl radicals such as n-heptyl, 1-methylhexyl and 1,4-dimethylpentyl; alkenyl and alkynyl radicals have the meanings of the unsaturated radicals which are possible and which correspond to the alkyl radicals; alkenyl is, for example, allyl, 1-methylprop-2-en-1-yl, 2-methylprop-2-en-1-yl, but-2-en-1-yl, but-3-en-1-yl, 1-methylbut-3-en-1-yl and 1-methylbut-2-en-1-yl; alkynyl is, for example, propargyl, but-2-yn-1-yl, but-3-yn-1-yl, 1-methylbut-3-yn-1-yl.

Cycloalkyl is a carbocyclic saturated ring system, for example one having 3-8 carbon atoms, for example cyclopropyl, cyclopentyl or cyclohexyl.

Alkenyl in the form "(3-4)alkenyl" or "(3-6)alkenyl" is, preferably, an alkenyl radical having 3 to 4, or 3 to 6, carbon atoms where the double bond is not on the carbon atom which is linked to the remaining moiety of the compound (I) ("yl" position). The same applies analogously to (3-4)alkynyl and the like.

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Halogen is, for example, fluorine, chlorine, bromine or iodine. Haloalkyl, -alkenyl and -alkynyl are alkyl, alkenyl and alkynyl, respectively, which are partially or fully substituted by halogen, preferably by fluorine, chlorine and/or bromine, in particular by fluorine or chlorine; for example CF_3, CHF_2, CH_2F, CF_3CF_2, CH_2FCHCl, CCl_3, $CHCl_2$, CH_2CH_2Cl; haloalkoxy is, for example, OCF_3, $OCHF_2$, OCH_2F, CF_3CF_2O, OCH_2CF_3 and OCH_2CH_2Cl; the same applies analogously to haloalkenyl and other halogen-substituted radicals.

A hydrocarbon radical is a straight-chain, branched or cyclic and saturated or unsaturated aliphatic or aromatic hydrocarbon radical, for example alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl or aryl; aryl is a mono-, bi- or polycyclic aromatic system, for example phenyl, naphthyl, tetrahydronaphthyl, indenyl, indanyl, pentalenyl, fluorenyl and the like, preferably phenyl;
a hydrocarbon radical is preferably alkyl, alkenyl or alkynyl having up to 12 carbon atoms or cycloalkyl having 3, 4, 5, 6 or 7 ring atoms or phenyl; the same applies analogously to a hydrocarbon radical in a hydrocarbon-oxy radical.

A heterocyclic radical or ring (heterocyclyl) can be saturated, unsaturated or heteroaromatic; preferably it has one or more hetero atoms in the ring, preferably selected from the group consisting of N, O and S; preferably it is an aliphatic heterocyclyl radical having 3 to 7 ring atoms or a heteroaromatic radical having 5 or 6 ring atoms, and has 1, 2 or 3 hetero atoms. The heterocyclic radical may be, for example, a heteroaromatic radical or ring (heteroaryl), such as, for example, a mono-, bi- or polycyclic aromatic system in which at least 1 ring has one or more hetero atoms, for example pyridyl, pyrimidinyl, pyridazinyl, pyrazinyl, thienyl, thiazolyl, oxazolyl, furyl, pyrrolyl, pyrazolyl and imidazolyl, or it is a partially or fully hydrogenated radical such as oxiranyl, pyrrolidyl, piperidyl, piperazinyl, dioxolanyl, morpholinyl, tetrahydrofuryl. Suitable substituents for a substituted heterocyclic radical are the substituents mentioned further below, and additionally also oxo. The oxo group may also occur on the hetero ring atoms which may exist at various oxidation levels, for example in the case of N and S.

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Substituted radicals, such as substituted hydrocarbon radicals, for example substituted alkyl, alkenyl, alkynyl, aryl, phenyl and benzyl, or substituted heterocyclyl or heteroaryl, are, for example, a substituted radical which is derived from the unsubstituted skeleton, the substituents being, for example, one or more, p[referably 1, 2 or 3, radicals selected from the group consisting of halogen, alkoxy, haloalkoxy, alkylthio, hydroxyl, amino, nitro, carboxyl, cyano, azido, alkoxycarbonyl, alkylcarbonyl, formyl, carbamoyl, mono- and dialkylaminocarbonyl, substituted amino such as acylamino, mono- and dialkylamino, and alkylsulfinyl, haloalkylsulfinyl, alkylsulfonyl, haloalkylsulfonyl and, in the case of cyclic radicals, also alkyl and haloalkyl, and also unsaturated aliphatic radicals which correspond to the abovementioned saturated hydrocarbon-containing radicals, such as alkenyl, alkynyl, alkenyloxy, alkynyloxy and the like. Amongst the radicals having carbon atoms, those having 1 to 4 carbon atoms, in particular 1 or 2 carbon atoms, are preferred. As a rule, preferred substituents are those selected from the group consisting of halogen, for example fluorine and chlorine, (1-4)alkyl, preferably methyl or ethyl, (1-4)haloalkyl, preferably trifluormethyl, (1-4)alkoxy, preferably methoxy or ethoxy, (1-4)haloalkoxy, nitro and cyano. Especially preferred are the substituents methyl, methoxy and chlorine.

Mono- or disubstituted amino means a chemically stable radical selected from the group of the substituted amino radicals which are N-substituted, for example, by one or two identical or different radicals selected from the group consisting of alkyl, alkoxy, acyl and aryl; preferably monoalkylamino, dialkylamino, acylamino, arylamino, N-alkyl-N-arylamino and also N-heterocycles; alkyl radicals having 1 to 4 carbon atoms are preferred; aryl is, preferably, phenyl or substituted phenyl; the definition mentioned further below applies to acyl, preferably (1-4)alkanoyl. The same applies analogously to substituted hydroxylamino or hydrazino.

Optionally substituted phenyl is, preferably, phenyl which is unsubstituted or mono- or polysubstituted, preferably up to trisubstituted, by identical or different radicals selected from the group consisting of halogen, (1-4)alkyl, (1-4)alkoxy, (1-4)halogenoalkyl, (1-4)halogenoalkoxy and nitro, for example o-, m- and p-tolyl,

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dimethylphenyl radicals, 2-, 3- and 4-chlorophenyl, 2-, 3- and 4-trifluoro- and -trichlorophenyl, 2,4-, 3,5-, 2,5- and 2,3-dichlorophenyl, o-, m- and p-methoxyphenyl.

An acyl radical is the radical of an organic acid, for example the radical of a carboxylic acid, and radicals of acids derived therefrom, such as of thiocarboxylic acid, optionally N-substituted iminocarboxylic acids, or the radical of carbonic monoesters, of optionally N-substituted carbamic acid, sulfonic acids, sulfinic acids, phosphonic acids and phosphinic acids. Acyl is, for example, formyl, alkylcarbonyl such as [(1-4)alkyl]carbonyl, phenylcarbonyl, it being possible for the phenyl ring to be substituted, for example as shown above for phenyl, or alkyloxycarbonyl, phenyloxycarbonyl, benzyloxycarbonyl, alkylsulfonyl, alkylsulfinyl, N-alkyl-1-iminoalkyl and other radicals of organic acids.

The invention also relates to all stereoisomers which the formula (I) embraces, and mixtures of these. Such compounds of the formula (I) have one or more asymmetric carbon atoms, or else double bonds which are not indicated specifically in formula (I). Possible stereoisomers which are defined by their specific spatial form, such as enantiomers, diastereomers and Z- and E-isomers, are all embraced by formula (I) and can be obtained by customary methods from stereoisomer mixtures, or else be prepared by stereoselective reactions in combination with the use of stereochemically pure starting materials.

The above examples of radicals or ranges of radicals which come under the general terms such as"alkyl", "acyl", "substituted radicals" and the like, are no complete enumeration. In particular, the general terms also embrace the definitions mentioned further below of ranges of radicals in groups of preferred compounds, in particular ranges of radicals which embrace specific radicals from the tabulated examples.

Compounds of the formula (I) according to the invention or salts thereof which are of particular interest, mainly for reasons of more potent herbicidal action, better selectivity and/or greater ease of preparation are those in which

R^1 is $S(O)_n$-R^{10} or CO-OR^{11},

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n is the number 0, 1 or 2, with the exception of the case $R^{10} = NR^{17}R^{18}$, in which case n = 2,

R^6 is H or (1-4)alkyl which is unsubstituted or substituted by one or more halogen atoms or by one or more radicals selected from the group (1-4)alkoxy and (1-4)alkylthio,

R^7 is formyl, [(1-6)alkyl]carbonyl, [(2-4)alkenyl]carbonyl, [(2-4)alkynyl]carbonyl, [(3-6)cycloalkyl]carbonyl or (1-6)alkylsulfonyl, each of the 5 last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio, (1-4)alkylsulfonyl, [(1-4)alkyl]carbonyl, [(1-4)alkoxy]carbonyl, [(1-4)alkyl]carbonyloxy and CN and, in the case of cyclic radicals, also (1-4)alkyl and (1-4)haloalkyl, or

phenylcarbonyl or phenylsulfonyl, each of the two last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, CN, SO_2, (1-4)alkyl, (1-4)haloalkyl, (1-4)alkoxy and (1-4)haloalkoxy, or

mono- or di[(1-4)-alkyl]aminosulfonyl, or a group of the formula -CO-CO-R' in which R' is (1-4)alkoxy, or

a group of the formula $-CW^o-R^{12}$, $-CW^o-NR^{13}R^{14}$ or $-CW^o-N(R^{15})_2$ or

R^6, R^7 together are a chain of the formula $(-CH_2)_{m1}B^1-$ or $-B^1-(CH_2)_{m2}B^2-$, m1 being 3, 4 or 5 and m2 being 2, 3 or 4, and

W, W^o in each case independently are an oxygen or sulfur atom,

T^o is an oxygen or sulfur atom,

B^1 is SO_2 or CO,

B^2 is SO_2 or CO,

Q is O, S or NR^{16},

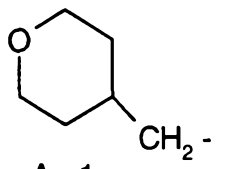
R^8 is a hydrogen atom,

R^9 is H or CH_3,

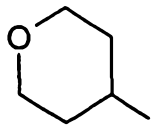
R^{10} is $NR^{17}R^{18}$, (1-6)alkyl or (3-6)cycloalkyl,

R^{11} is H, (1-6)alkyl, (3-6)cycloalkyl or a radical of the formulae A-1 to A-6,

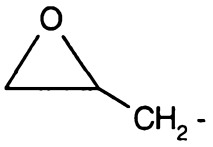
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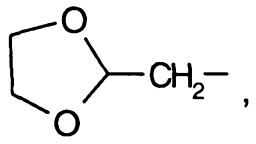
A - 1



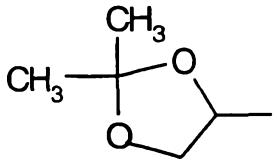
A - 2



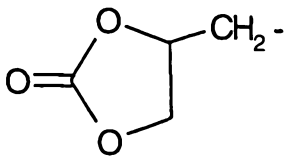
A - 3



A - 4



A - 5



A - 6

R^{12} is (1-4)alkyl or (1-4)haloalkyl,

R^{13}, R^{14} independently of one another are H or (1-4)alkyl,

the radicals R^{15} together are a divalent chain of the formula $-(CH_2)_{m3}-$ in which m3 is 3, 4 or 5, or of the formula $-CH_2CH_2-O-CH_2CH_2-$,

R^{16} is H or (1-4)alkyl,

R^{17} is H or (1-4)alkyl and

R^{18} is H or (1-4)alkyl.

Preferred compounds of the formula (I) according to the invention and salts thereof are those in which

R^6 is H or (1-4)alkyl,

R^7 is CHO, [(1-6)alkyl]carbonyl, [(1-4)haloalkyl]carbonyl, [(1-4)alkoxy-(1-4)alkyl]carbonyl, [(3-6)cycloalkyl]carbonyl, phenylcarbonyl which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, CN, NO_2, (1-4)alkyl, (1-4)haloalkyl, (1-4)alkoxy and (1-4)haloalkoxy, or is phenylsulfonyl which is unsubstituted or substituted by one or more radicals selected from the group consisting of (1-4)alkyl and (1-4)alkoxy, or is mono- or di[(1-4)alkyl]aminosulfonyl, (1-6)alkylsulfonyl, (1-4)haloalkylsulfonyl or a group of the formula

$-CW^o-R^{12}$ or $-CW^o-NR^{13}R^{14}$

W^o independently of one another are in each case O or S,

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T^o is O or S,

Q is O, S or NR^{16},

R^{10} is $NR^{17}R^{18}$, (1-4)alkyl or (3-6)cycloalkyl,

R^{11} is H or (1-4)alkyl,

R^{12} is (1-4)alkyl,

R^{13}, R^{14} independently of one another are H or (1-4)alkyl,

R^{16} is H or (1-3)alkyl,

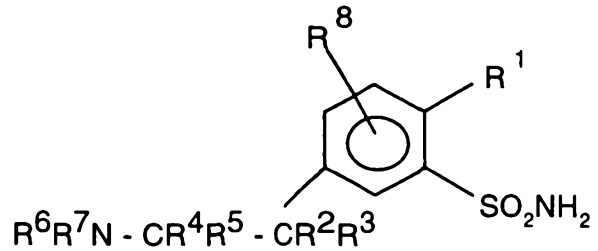
R^{17} is (1-4)alkyl and

R^{18} is H or (1-4)alkyl.

Other preferred compounds of the formula (I) according to the invention or salts thereof are those which contain a combination of radicals of the abovementioned compounds of particular interest or of the preferred compounds, and those which contain individual or several radicals from amongst the compounds listed in Table 1 or 2 (see below).

The present invention also relates to processes for the preparation of the compounds of the formula (I) or salts thereof, which comprise

a) reacting a compound of the formula (II)



(II)

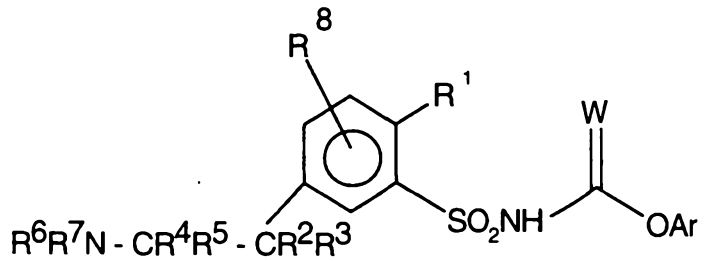
with a heterocyclic carbamate of the formula (III)

$$R^* - O - CO - NR^9 - A \qquad (III)$$

in which R* is optionally substituted phenyl or (C_1-C_4)alkyl, or

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b) reacting an arylsulfonylcarbamate of the formula (IV)

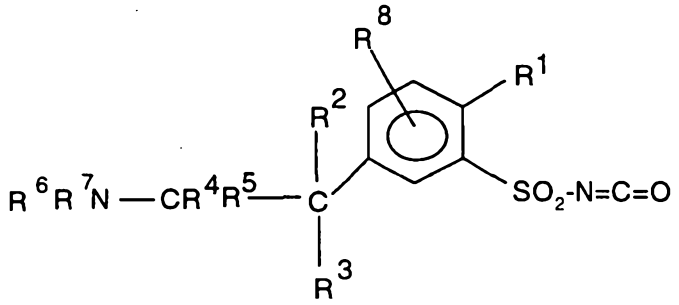


(IV)

in which Ar is an aryl radical, preferably an optionally substituted phenyl, with an amino heterocycle of the formula (V)

$$H - NR^9 - A \qquad (V), \text{ or}$$

c) reacting a sulfonyl isocyanate of the formula (VI)

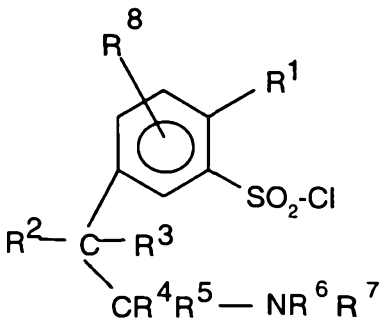


(VI)

with an amino heterocycle of the formula $H\text{-}NR^9\text{-}A$ (V), or

d) first reacting, in a one-pot reaction, an amino heterocycle of the formula $H\text{-}NR^9\text{-}A$ (V) with phosgene in the presence of a base and reacting the intermediate formed with a phenylsulfonamide of the formula (II), or

e) reacting a sulfonyl chloride of the formula (VII)



(VII)

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with a cyanate M-OCN in which M = a cation, for example NH_4, Na or K, and with an amino heterocycle of the formula H-NR^9-A (V) in the presence of a base, or

f) reacting a sulfonamide of the abovementioned formula (II) with a (thio)isocyanate of the formula (V')

$$W = C = N - A \qquad (V')$$

in the presence of a base,

where, in formulae (II)-(VII) and (V'), the radicals or symbols R^1-R^9, A, W and n are as defined in formula (I) and where, in variants a) and c)-e), the initial products are compounds of the formula (I) where W = O.

The reaction of the compounds of the formulae (II) and (III) is preferably carried out with base catalysis in an inert organic solvent such as, for example, dichloromethane, acetonitrile, dioxane or THF, at temperatures between 0°C and the boiling point of the solvent. Bases which are used for this purpose are, for example, organic amine bases such as 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU), in particular when R* = (substituted) phenyl (cf. EP-A-44807), or trimethylaluminum or triethylaluminum, the latter two substances in particular when R* = alkyl (cf. EP-A-166516).

The sulfonamides (II) are novel compounds. They and their preparation are also subject of the present invention.

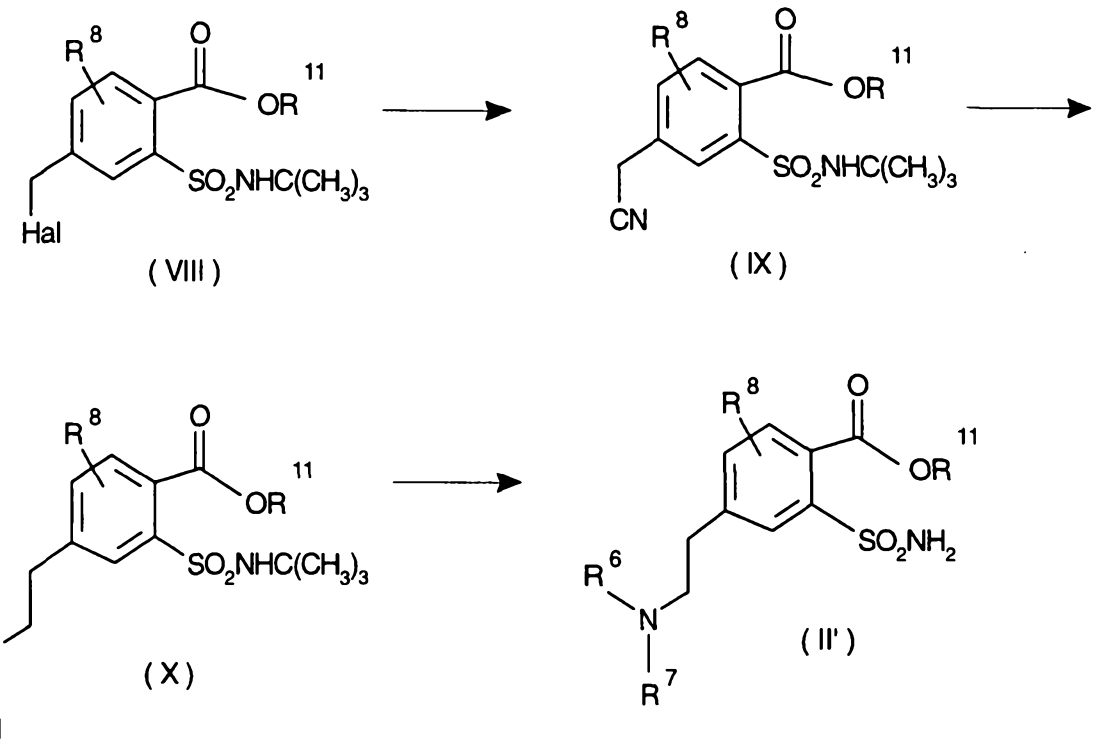
With reference to the compounds (II) where R^2 to R^5=H and R^1=$COQR^{11}$ where Q=O, the following text will illustrate in greater detail possible preparation methods which, when modified slightly, may also be employed for compounds where R^2-R^5 are other than hydrogen or where R^1 is as described above.

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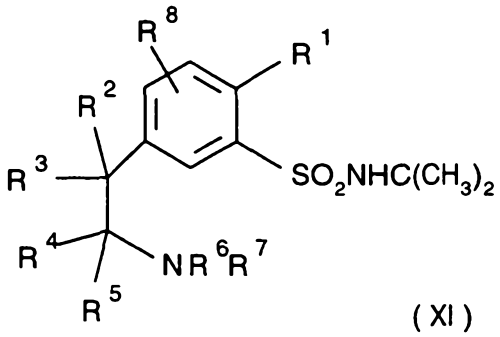
Starting from optionally substituted benzyl halides (VIII) (see Diagram 1; cf. WO 95/10507), benzyl cyanide (IX) may be obtained by nucleophilic exchange of the halide for cyanide. After reduction or hydrogenolysis of (IX) and, if appropriate, subsequent functionalization of the amino group, for example by alkylation, phenethylamines (X) or phenethylamines (XI) are obtained in which $R^1 = COR^{11}$, $R^2=R^3=R^4=R^5=R^7 = H$ and which, if appropriate after further functionalization, for example by acylation or by eliminating the tert-butyl group, are reacted in analogy to known processes (for example with CF_3COOH) to give the sulfonamides (II') (see Diagram 1).

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Diagram 1



The procedure may also be employed analogously for the preparation of other compounds of the formula (II), the compound of the formula (XI)



being employed in the last step.

The carbamates of the formula (II) can be prepared by methods described in the South African Patent Applications 82/5671 and 82/5045, and EP-A-70804 (US-A-4 480 101) or RD 275056.

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The reaction of the compounds (IV) with the amino heterocycles (V) is preferably carried out in inert aprotic solvents such as, for example, dioxane, acetonitrile or tetrahydrofuran at temperatures between 0°C and the boiling point of the solvent. The starting materials (V) required are known from the literature or can be prepared by processes known from the literature. The arylsulfonylcarbamates of the formula (IV) are obtained analogously to US-PS 4 684 393 or US-PS-4 743 290.

The aryl- or phenylsulfonyl isocyanates of the formula (VI) can be prepared analogously to US-PS-4 481 029 and reacted with the amino heterocycles (V).

The phosgenation of compounds of the formula (V) in accordance with variant d) can preferably be carried out in the presence of bases, such as sterically hindered organic amine bases, for example triethylamine. The subsequent reaction with compounds of the formula (II) in accordance with variant d) can be carried out in analogy to known processes (cf. EP-A-232 067).

The sulfochlorides (VII) can be obtained from corresponding sulfonic acids, for example by standard methods such as reacting the potassium salt with phosphorus oxychloride or thionyl chloride in inert solvents such as acetonitrile and/or sulfolane or in substance by refluxing (cf. Houben-Weyl-Klamann, "Methoden der organischen Chemie" [Methods in Organic Chemistry], 4th Ed. Vol 3 XI/2, pp. 1067-1073, Thieme Verlag Stuttgart, 1985).

The corresponding sulfonic acids are obtainable from corresponding nitro compounds in analogy to the reaction of compounds (XI).

Alternatively, sulfochlorides (VII) can be obtained in individual cases by sulfonating (+ chlorinating) or sulfochlorinating suitable substituted benzoic esters; sulfochlorination in analogy to Houben-Weyl-Klamann, "Methoden der organischen Chemie" [Methods in Organic Chemistry], 4th Ed. Vol. E XI/2, p. 1067 et seq., Thieme Verlag Stuttgart, 1985; Houben-Weyl-Müller, "Methoden der organischen Chemie" [Methods in Organic Chemistry], 4th Ed. Vol. IX, p. 563 et seq., Thieme

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Verlag Stuttgart, 1955; sulfonation in analogy to Houben-Weyl-Klamann, "Methoden der organischen Chemie" [Methods in Organic Chemistry], 4th Ed. Vol. E XI/2, p.1055 et seq., Thieme Verlag Stuttgart, 1985; Houben-Weyl-Müller, "Methoden der organischen Chemie" [Methods in Organic Chemistry], 4th Ed. Vol. IX, p. 435 et seq., Thieme Verlag Stuttgart, 1955.

The (thio)isocyanates of the formula (V') can be obtained by processes known from the literature (EP-A-232067, EP-A-166516). The reaction of the (thio)isocyanates (V') with compounds (II) is carried out, for example, at -10°C to 100°C, preferably 20 to 100°C, in an inert aprotic solvent such as, for example, acetone or acetonitrile, in the presence of a suitable base, for example $N(C_2H_5)_3$ or K_2CO_3.

The salts of the compounds of the formula (I) are preferably prepared in inert polar solvents such as, for example, water, methanol or acetone at temperatures from 0-100°C. Bases which are suitable for the preparation of the salts according to the invention are, for example, alkali metal carbonates such as potassidum carbonate, alkali metal hydroxides and alkaline earth metal hydroxides, eg. NaOH or KOH, or ammonia or ethanolamine.

The term "inert solvents" used in the above process variants is to be understood as meaning in each case solvents which are inert under the reaction conditions in question, but which need not be inert under all reaction conditions.

The compounds of the formula (I) according to the invention have an outstanding herbicidal activity against a broad spectrum of economically important monocotyledonous and dicotyledonous harmful plants. The active ingredients also act efficiently on perennial weeds which produce shoots from rhizomes, root stocks or other perennial organs and which are difficult to control. In this context, it is immaterial whether the substances are applied pre-sowing, pre-emergence or post-emergence.

Specifically, examples may be mentioned of some representatives of the

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monocotyledonous and dicotyledonous weed flora which can be controlled by the compounds according to the invention, without these being a restriction to certain species.

Examples of weed species on which the active ingredient acts efficiently are, from amongst the monocotyledons, Avena, Lolium, Alopecurus, Phalaris, Echinochloa, Digitaria, Setaria and also Cyperus species from the annual sector and from amongst the perennial species Agropyron, Cynodon, Imperata and Sorghum, and also perennial Cyperus species.

In the case of the dicotyledonous weed species, the spectrum of action extends to species such as, for example, Galium, Viola, Veronica, Lamium, Stellaria, Amaranthus, Sinapis, Ipomoea, Matricaria, Abutilon and Sida from amongst the annuals, and Convolvulus, Cirsium, Rumex and Artemisia in the case of the perennial weeds.

The active ingredients according to the invention also effect outstanding control of weeds which occur under the specific conditions of rice growing such as, for example, Sagittaria, Alisma, Eleocharis, Scirpus and Cyperus.

If the compounds according to the invention are applied to the soil surface prior to germination, then the weed seedlings are either prevented completely from emerging, or the weeds grow until they have reached the cotyledon stage but then their growth stops, and, eventually, after three to four weeks have elapsed, they die completely.

If the active ingredient is applied post-emergence to the green parts of the plants, growth also stops drastically a very short time after the treatment and the weed plants remain at the developmental stage of the point in time of application, or they die completely after a certain time, so that in this manner competition by the weeds, which is harmful to the crop plants, is eliminated at a very early point in time and in a sustained manner.

Although the compounds according to the invention have an excellent herbicidal

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activity against monocotyledonous and dicotyledenous weeds, crop plants of economically important crops such as, for example, wheat, barley, rye, rice, maize, sugar beet, cotton and soya, are not damaged at all, or only to a negligible extent. For these reasons, the present compounds are highly suitable for selectively controlling undesired plant growth in plantings for agricultural use.

In addition, the substances according to the invention have excellent growth-regulating properties in crop plants. They engage in the plant metabolism in a regulating manner and can thus be employed for the targeted control of plant constituents and for facilitating harvesting, such as, for example, by provoking desiccation and stunted growth. Furthermore, they are also suitable for generally regulating and inhibiting undesired vegetative growth, without destroying the plants in the process. Inhibition of vegetative growth plays an important role in many monocotyledonous and dicotyledenous crops since lodging can be reduced hereby, or prevented completely.

The compounds according to the invention can be employed in the conventional preparations in the form of wettable powders, emulsifiable concentrates, sprayable solutions, dusts or granules. Another subject of the invention are therefore also herbicidal and plant-growth-regulating compositions which comprise the compounds of the formula (I).

The compounds of the formula (I) can be formulated in various ways, depending on the prevailing biological and/or chemico-physico parameters. Examples of possible formulations which are suitable are: wettable powders (WP), water-soluble powders (SP), water-soluble concentrates, emulsifiable concentrates (EC), emulsions (EW) such as oil-in-water and water-in-oil emulsions, sprayable solutions, suspension concentrates (SC), oil- or water-based dispersions, solutions which are miscible with oil, capsule suspensions (CS), dusts (DP), seed-dressing products, granules for broadcasting and soil application, granules (GR) in the form of microgranules, spray granules, coated granules and adsorption granules, water-dispersible granules (WG), water-soluble granules (SG), ULV formulations, microcapsules and waxes.

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These individual formulation types are known in principle and are described, for example, in: Winnacker-Küchler, "Chemische Technologie" [Chemical Technology], Volume 7, C. Hauser Verlag Munich, 4th Ed. 1986, Wade van Valkenburg, "Pesticide Formulations", Marcel Dekker, N.Y., 1973; K. Martens, "Spray Drying" Handbook, 3rd Ed. 1979, G. Goodwin Ltd. London.

The necessary formulation auxiliaries such as inert materials, surfactants, solvents and other additives are also known and described, for example, in: Watkins, "Handbook of Insecticide Dust Diluents and Carriers", 2nd Ed., Darland Books, Caldwell N.J., H.v. Olphen, "Introduction to Clay Colloid Chemistry"; 2nd Ed., J. Wiley & Sons, N.Y.; C. Marsden, "Solvents Guide"; 2nd Ed., Interscience, N.Y. 1963; McCutcheon's "Detergents and Emulsifiers Annual", MC Publ. Corp., Ridgewood N.J.; Sisley and Wood, "Encyclopedia of Surface Active Agents", Chem. Publ. Co. Inc., N.Y. 1964; Schönfeldt, "Grenzflächenaktive Äthylenoxidaddukte" [Surface-active Ethylene Oxide Adducts], Wiss. Verlagsgesell., Stuttgart 1976; Winnacker-Küchler, "Chemische Technologie" [Chemical Technology], Volume 7, C. Hauser Verlag Munich, 4th Ed. 1986.

Based on these formulations, it is also possible to prepare combinations with other pesticidally active substances such as, for example, insecticides, acaricides, herbicides, fungicides, and with safeners, fertilizers and/or growth regulators, for example in the form of a readymix or a tank mix.

Wettable powders are preparations which are uniformly dispersible in water and which, in addition to the active ingredient, also comprise ionic and/or non-ionic surfactants (wetters, dispersants), for example polyoxyethylated alkylphenols, polyoxyethylated fatty alcohols, polyoxyethylated fatty amines, fatty alcohol polyglycol ether sulfates, alkanesulfonates, alkylbenzenesulfonates, sodium lignosulfonate, sodium 2,2'-dinaphthylmethane-6,6'-disulfonate, sodium dibutylnaphthalenesulfonate, or else sodium oleoylmethyltaurinate, in addition to a diluent or inert substance. To prepare the wettable powders, the herbicidally active ingredients are ground finely, for example in customary apparatuses such as

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hammer mills, blower mills and air-jet mills, and mixed with the formulation auxiliaries, either simultaneously or subsequently.

Emulsifiable concentrates are prepared, for example, by dissolving the active ingredient in an organic solvent, for example butanol, cyclohexanone, dimethylformamide, xylene, or else higher-boiling aromatics or hydrocarbons or mixtures of the organic solvents with the addition of one or more ionic or non-ionic surfactants (emulsifiers). Emulsifiers which can be used are, for example: calcium salts of alkylarylsulfonic acids, such as calcium dodecylbenzenesulfonate, or non-ionic emulsifiers such as fatty acid polyglycol esters, alkylaryl polyglycol ethers, fatty alcohol polyglycol ethers, propylene oxide/ethylene oxide condensates, alkyl polyethers, sorbitan esters, such as, for example, sorbitan fatty acid esters or polyoxyethylene sorbitan esters such as, for example, polyoxyethylene sorbitan fatty acid esters.

Dusts are obtained by grinding the active ingredient with finely divided solid substances, for example talc or natural clays such as kaolin, bentonite and pyrophyllite, or diatomaceous earth.

Suspension concentrates can be water- or oil-based. They can be obtained, for example, by wet grinding by means of commercially available bead mills and, if appropriate, an addition of surfactants as have already been mentioned for example above in the case of the other formulation types.

Emulsions, for example oil-in-water emulsions (EW), can be prepared for example by means of stirrers, colloid mills and/or static mixers using aqueous organic solvents and, if appropriate, surfactants as have already been mentioned for example above in the case of the other formulation types.

Granules can be prepared either by spraying the active ingredient onto adsorptive, granulated inert material or by applying active ingredient concentrates to the surface of carriers such as sand, kaolinites or of granulated inert material, by means of

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binders, for example polyvinyl alcohol, sodium polyacrylate or else mineral oils. Suitable active ingredients can also be granulated in a manner which is conventional for the production of fertilizer granules, if desired in a mixture with fertilizers.

Water-dispersible granules are prepared, as a rule, by the customary processes such as spray drying, fluidized-bed granulation, disk granulation, mixing with high-speed mixers and extrusion without solid inert material.
To prepare disk, fluidized-bed, extruder and spray granules, see, for example, processes in "Spray-Drying Handbook" 3rd Ed. 1979, G. Goodwin Ltd., London; J.E. Browning, "Agglomeration", Chemical and Engineering 1967, pages 147 et seq.; "Perry's Chemical Engineer's Handbook", 5th Ed., McGraw-Hill, New York 1973, pp. 8-57.

For further information on the formulation of crop protection products see, for example, G.C. Klingman, "Weed Control as a Science", John Wiley and Sons, Inc., New York, 1961, pages 81-96 and J.D. Freyer, S.A. Evans, "Weed Control Handbook", 5th Ed., Blackwell Scientific Publications, Oxford, 1968, pages 101-103.

As a rule, the agrochemical preparations comprise 0.1 to 99% by weight, in particular 0.1 to 95% by weight, of active ingredient of the formula (I). In wettable powders, the active ingredient concentration is, for example, approximately 10 to 90% by weight, the remainder to 100% by weight being composed of customary formulation components. In the case of emulsifiable concentrates, the active ingredient concentration can be about 1 to 90, preferably from 5 to 80, % by weight. Formulations in the form of dusts comprise 1 to 30% by weight of active ingredient, preferably in most cases 5 to 20% by weight of active ingredient, and sprayable solutions comprise approximately 0.05 to 80, preferably 2 to 50, % by weight of active ingredient. In the case of water-dispersible granules, the active ingredient content depends partly on whether the active compound is present in liquid or solid form and on which granulation auxiliaries, fillers and the like are being used. The water-dispersible granules comprise, for example, between 1 and 95% by weight, preferably between 10 and 80% by weight, of active ingredient.

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In addition, the active ingredient formulations mentioned comprise, if appropriate, the adhesives, wetters, dispersants, emulsifiers, penetrants, preservatives, antifreeze agents, solvents, fillers, carriers, colorants, antifoams, evaporation inhibitors and pH and viscosity regulators which are conventional in each case.

Suitable active ingredients which can be combined with the active ingredients according to the invention in mixed formulations or in a tank mix are, for example, known active ingredients as described from for example from Weed Research 26, 441-445 (1986), or "The Pesticide Manual", 10th edition, The British Crop Protection Council and the Royal Soc. of Chemistry, 1994 and in the literature cited therein. For example the following active ingredients may be mentioned as herbicides which are known from the literature and which can be combined with the compounds of the formula (I) (note: the compounds are either named by the "common name" in accordance with the International Organization for Standardization (ISO) or by the chemical names, if appropriate together with a customary code number): acetochlor; acifluorfen; aclonifen; AKH 7088, i.e. [[[1-[5-[2-chloro-4-(trifluoro-methyl)phenoxy]-2-nitrophenyl]-2-methoxyethylidene]amino]oxy] acetic acid and its methyl ester; alachlor; alloxydim; ametryn; amidosulfuron; amitrol; AMS, i.e. ammonium sulfamate; anilofos; asulam; atrazine; azimsulfurone (DPX-A8947); aziprotryn; barban; BAS 516 H, i.e. 5-fluoro-2-phenyl-4H-3,1-benzoxazin-4-one; benazolin; benfluralin; benfuresate; bensulfuron-methyl; bensulide; bentazone; benzofenap; benzofluor; benzoylprop-ethyl; benzthiazuron; bialaphos; bifenox; bromacil; bromobutide; bromofenoxim; bromoxynil; bromuron; buminafos; busoxinone; butachlor; butamifos; butenachlor; buthidazole; butralin; butylate; cafenstrole (CH-900); carbetamide; cafentrazone (ICI-A0051); CDAA, i.e. 2-chloro-N,N-di-2-propenylacetamide; CDEC, i.e. 2-chloroallyl diethyldithiocarbamate; chlomethoxyfen; chloramben; chlorazifop-butyl, chlormesulon (ICI-A0051); chlorbromuron; chlorbufam; chlorfenac; chlorflurecol-methyl; chloridazon; chlorimuron ethyl; chlornitrofen; chlorotoluron; chloroxuron; chlorpropham; chlorsulfuron; chlorthal-dimethyl; chlorthiamid; cinmethylin; cinosulfuron; clethodim; clodinafop and its ester derivatives (for example clodinafop-propargyl); clomazone; clomeprop; cloproxydim; clopyralid; cumyluron (JC 940); cyanazine; cycloate;

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cyclosulfamuron (AC 104); cycloxydim; cycluron; cyhalofop and its ester derivatives (for example butyl ester, DEH-112); cyperquat; cyprazine; cyprazole; daimuron; 2,4-DB; dalapon; desmedipham; desmetryn; di-allate; dicamba; dichlobenil; dichlorprop; diclofop and its esters such as diclofop-methyl; diethatyl; difenoxuron; difenzoquat; diflufenican; dimefuron; dimethachlor; dimethametryn; dimethenamid (SAN-582H); dimethazone, dimethipin; dimetrasulfuron, dinitramine; dinoseb; dinoterb; diphenamid; dipropetryn; diquat; dithiopyr; diuron; DNOC; eglinazine-ethyl; EL 77, i.e. 5-cyano-1-(1,1-dimethylethyl)-N-methyl-1H-pyrazole-4-carboxamide; endothal; EPTC; esprocarb; ethalfluralin; ethametsulfuron-methyl; ethidimuron; ethiozin; ethofumesate; F5231, i.e. N-[2-chloro-4-fluoro-5-[4-(3-fluoropropyl)-4,5-dihydro-5-oxo-1H-tetrazol-1-yl]-phenyl]ethanesulfonamide; ethoxyfen and its esters (for example ethyl ester, HN-252); etobenzanid (HW 52); fenoprop; fenoxan, fenoxaprop and fenoxaprop-P and their esters, for example fenoxaprop-P-ethyl and fenoxaprop-ethyl; fenoxydim; fenuron; flamprop-methyl; flazasulfuron; fluazifop and fluazifop-P and their esters, for example fluazifop-butyl and fluazifop-P-butyl; fluchloralin; flumetsulam; flumeturon; flumiclorac and its esters (for example pentyl ester, S-23031); flumioxazin (S-482); flumipropyn; flupoxam (KNW-739); fluorodifen; fluoroglycofen-ethyl; flupropacil (UBIC-4243); fluridone; flurochloridone; fluroxypyr; flurtamone; fomesafen; fosamine; furyloxyfen; glufosinate; glyphosate; halosafen; halosulfuron and its esters (for example methyl ester, NC-319); haloxyfop and its esters; haloxyfop-P (= R-haloxyfop) and its esters; hexazinone; imazamethabenz-methyl; imazapyr; imazaquin and salts such as the ammonium salt; imazethamethapyr; imazethapyr; imazosulfuron; ioxynil; isocarbamid; isopropalin; isoproturon; isouron; isoxaben; isoxapyrifop; karbutilate; lactofen; lenacil; linuron; MCPA; MCPB; mecoprop; mefenacet; mefluidid; metamitron; metazachlor; methabenzthiazuron; metham; methazole; methoxyphenone; methyldymron; metabenzuron, methobenzuron; metobromuron; metolachlor; metosulam (XRD 511); metoxuron; metribuzin; metsulfuron-methyl; MH; molinate; monalide; monocarbamide dihydrogensulfate; monolinuron; monuron; MT 128, i.e. 6-chloro-N-(3-chlor-2-propenyl)-5-methyl-N-phenyl-3-pyridazinamine; MT 5950, i.e. N-[3-chloro-4-(1-methylethyl)-phenyl]-2-methylpentanamide; naproanilide; napropamide; naptalam; NC 310, i.e. 4-(2,4-dichlorobenzoyl)-1-methyl-5-

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benzyloxypyrazole; neburon; nicosulfuron; nipyraclophen; nitralin; nitrofen; nitrofluorfen; norflurazon; orbencarb; oryzalin; oxadiargyl (RP-020630); oxadiazon; oxyfluorfen; paraquat; pebulate; pendimethalin; perfluidone; phenisopham; phenmedipham; picloram; piperophos; piributicarb; pirifenop-butyl; pretilachlor; primisulfuron-methyl; procyazine; prodiamine; profluralin; proglinazine-ethyl; prometon; prometryn; propachlor; propanil; propaquizafop and its esters; propazine; propham; propisochlor; propyzamide; prosulfalin; prosulfocarb; prosulfuron (CGA-152005); prynachlor; pyrazolinate; pyrazon; pyrazosulfuron-ethyl; pyrazoxyfen; pyridate; pyrithiobac (KIH-2031); pyroxofop and its esters (for example propargyl ester); quinclorac; quinmerac; quinofop and its ester derivatives, quizalofop and quizalofop-P and their ester derivatives, for example quizalofop-ethyl; quizalofop-P-tefuryl and -ethyl; renriduron; rimsulfuron (DPX-E 9636); S 275, i.e. 2-[4-chloro-2-fluoro-5-(2-propynyloxy)phenyl]-4,5,6,7-tetrahydro-2H-indazole; secbumeton; sethoxydim; siduron; simazine; simetryn; SN 106279, i.e. 2-[[7-[2-chloro-4-(trifluoromethyl)phenoxy]-2-naphthalenyl]oxy]propanoic acid and its methyl ester; sulfentrazon (FMC-97285, F-6285); sulfazuron; sulfometuron-methyl; sulfosate (ICI-A0224); TCA; tebutam (GCP-5544); tebuthiuron; terbacil; terbucarb; terbuchlor; terbumeton; terbuthylazine; terbutryn; TFH 450, i.e. N,N-diethyl-3-[(2-ethyl-6-methylphenyl)sulfonyl]-1H-1,2,4-triazol-1-carboxamide; thenylchlor (NSK-850); thiazafluron; thiazopyr (Mon-13200); thidiazimin (SN-24085); thifensulfuron-methyl; thiobencarb; tiocarbazil; tralkoxydim; tri-allate; triasulfuron; triazofenamide; tribenuron-methyl; triclopyr; tridiphane; trietazine; trifluralin; triflusulfuron and its esters (for example methyl ester, DPX-66037); trimeturon; tsitodef; vernolate; WL 110547, i.e. 5-phenoxy-1-[3-(trifluoromethyl)phenyl]-1H-tetrazole; UBH-509; D-489; LS 82-556; KPP-300; NC-324; NC-330; KH-218; DPX-N8189; SC-0774; DOWCO-535; DK-8910; V-53482; PP-600; MBH-001; KIH-9201; ET-751; KIH-6127 and KIH-2023.

For use, the formulations which are present in commercially available form are, if appropriate, diluted in the customary manner, for example using water in the case of wettable powders, emulsifiable concentrates, dispersions and water-dispersible granules. Products in the form of dusts, granules for soil application or broadcasting

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and sprayable solutions are usually not further diluted with other inert substances prior to use.

The application rate of the compounds of the formula (I) required varies with the external conditions, such as temperature, humidity, the nature of the herbicide used and the like. It can vary within wide limits, for example between 0.001 and 10.0 kg/ha or more of active substance, but it is preferably between 0.005 and 5 kg/ha.

A. Chemical Examples

Abbreviations: Terms like percentages and ratios are based on weight, unless otherwise specified; in vacuo means under reduced pressure; h = hour(s)

Example A1

Methyl 2-(tert-butylaminosulfonyl)-4-cyanomethylbenzoate

A two-phase mixture of 100 g of 61.5% pure methyl 2-(tert-butylaminosulfonyl)-4-bromomethylbenzoate (61.5 g = 0.169 mol), 12.09 g (0.186 mol) of potassium cyanide and 10.89 g (33.8 mmol) of tetrabutylammonium bromide in 750ml of dichloromethane and 150 ml of water is stirred for 6 hours at room temperature. For working-up, the batch was diluted with water, the phases were separated, and the aqueous phase was re-extracted twice with dichloromethane. The combined organic extracts were dried over Na_2SO_4. The crude product obtained after concentration was separated by chromatography on silica gel using an ethyl acetate/petroleum ether mixture (1:2, v/v). Concentration of the fractions with R_F= 0.18 yielded 48.1 g (91.8%) of methyl 2-(tert-butylaminosulfonyl)-4-cyanomethylbenzoate of m.p.: 86-88°C.

Example A2

Methyl 4-(2-aminoethyl)-2-tert-butylaminosulfonylbenzoate

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After 0.5 g of platinum oxide hydrate had been added to a solution of 2.5 g (8.05 mmol) of methyl 2-(tert-butylaminosulfonyl)-4-cyanomethylbenzoate in 200 ml of methanol and 4 ml of concentrated HCl, the mixture was hydrogenated for 10 hours at room temperature and under a hydrogen pressure of 20 bar. For working-up, the catalyst was removed by filtration and the filtrate was concentrated. After the residue had been taken up in ethyl acetate, the solution was washed four times with 2 N HCl. The combined acidic aqueous phases are brought to pH 10-11 with concentrated ammonia and extracted three times with ethyl acetate. The organic extracts were dried over Na_2SO_4 and concentrated in vacuo. This gave 1.9 g (75%) of methyl 4-(2-aminoethyl)-2-tert-butylaminosulfonylbenzoate as an oil.

^{1}H NMR (300 MHz, $CDCl_3$): δ : 1.26 (s, 9H, $C(CH_2)_3$); 1.70 (bs, 2H, NH_2); 2.88 and 3.02 (2m, in each case 2H, Ar-CH_2CH_2-N); 3.96 (s, 3H, OCH_3); 6.04 (bs, 1H, SO_2NH); 7.42 (dd, 1H, Ar-H, J = 2Hz, 8 Hz); 7.77 (d, 1H, Ar-H, J = 8 Hz); 8.00 (d, 1H, Ar-H,J = 2Hz).

Example A3

Methyl 2-tert-butylaminosulfonyl-4-[2-(methoxycarbonylamino)ethyl]benzoate

A solution of 1.45 g (4.6 mmol) of methyl 4-(2-aminoethyl)-2-tert-butylamino-sulfonylbenzoate and 0.71 ml (5.1 mmol) of triethylamine in 10 ml of dichloromethane was added dropwise to an ice-cooled solution of 1.31 g (13.8 mmol) of methyl chloroformate in 20 ml of dichloromethane. After 2 h at room temperature, water was added, the phases were separated, and the aqueous phase was re-extracted twice with dichloromethane. The combined organic extracts were washed with water, dried over Na_2SO_4 and concentrated in vacuo. This gave 1.4 g (81%) of methyl 2-tert-butylaminosulfonyl-4-[2-(methoxycarbonylamino)ethyl]benzoate as a viscous oil.

^{1}H NMR (300 MHz, $CDCl_3$): δ = 1.24 (s, 9H, $C(CH_3)_3$), 2.95 (m, 2H, Ar-CH_2-CH_2N); 3.45 (m, 2H, Ar-CH_2CH_2N); 3.65 (s, 3H, OCH_3); 3.95 (s, 3H, OCH_3); 4.70 (bs, 1H, CONH); 6.20 (s, 1H, SO_2NH); 7.40 (bd, 1H, Ar-H, J = 8Hz);

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7.80 (d, 1H, Ar-H, J = 8Hz); 8.00 (bs, 1H, Ar-H).

Example A4

Methyl 2-aminosulfonyl-4-[2-(methoxycarbonylamino)ethyl]benzoate

A solution of 1.4 g (3.8 mmol) of methyl 2-tert-butylaminosulfonyl-4-[2-(methoxycarbonylamino]ethyl]benzoate in 20 ml of trifluoroacetic acid was stirred for 8 hours at room temperature. The batch was evaporated completely, re-evaporated with toluene, and the residue obtained was crystallized with ethyl acetate/diisopropyl ether. This gave 0.54 g (45%) of methyl 2-aminosulfonyl-4-[2-(methoxycarbonylamino)-ethyl]benzoate of m.p.: 146-149°C.

Example A5

Methyl 2-[(4,6-dimethoxypyrimidin-2-yl)aminocarbonylaminosulfonyl]-4-[2-(methoxycarbonylamino)ethyl]benzoate

0.26 ml (1.7 mmol) of DBU was added dropwise to a suspension of 0.54 g (1.7 mmol) of methyl 2-aminosulfonyl-4-[2-(methoxycarbonylamino)ethyl]benzoate and 0.47 g (1.7 mmol) of N-(4,6-dimethoxypyrimidin-2-yl)phenylcarbamate in 15 ml of acetonitrile. After 2 h, the mixture was diluted with water and diethyl ether and acidified with HCl to pH 1-2, and the product precipitated was removed by filtration, washed with water and diethyl ether and dried. Yield: 0.47 g (55.6%) of methyl 2-[(4,6-dimethoxypyrimidin-2-yl)aminocarbonylaminosulfonyl]-4-[2-(methoxycarbonylamino)ethyl]benzoate of m.p.: 165-169°C/decomp.

The compounds of Tables 1 and 2 which follow are obtained analogously to Examples A1 to A5 and the abovementioned chemical processes or generally known processes.

Abbreviations and explanations regarding Tables 1 and 2:

No.= Example number, exemplary compound No.

Me = CH_3 = methyl

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Et = C_2H_5 = ethyl

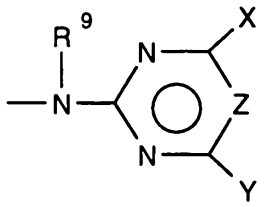
Pr = n-Pr = nPr = n-C_3H_7 = n-propyl,

i-Pr = iPr = i-C_3H_7 = isopropyl

n-, i-, s-, tert-Bu = n-, i-, s-, tert-butyl

c-Alkyl = cycloalkyl

Sub-structures of the formula T* (for columns 4 and 5 in Tables 1 and 2, respectively) are radicals of the formula



(T*)

with the meanings given in the table which follows:

T*	R^9	X	Y	Z
T1	H	OMe	OMe	CH
T2	H	OMe	Me	CH
T3	H	Me	Me	CH
T4	H	Me	OEt	CH
T5	H	Et	OMe	CH
T6	H	OEt	OEt	CH
T7	H	$OCHF_2$	$OCHF_2$	CH
T8	H	Me	$OCHF_2$	CH
T9	H	Cl	OMe	CH
T10	H	OMe	OMe	N
T11	H	OMe	Me	N
T12	H	Me	Me	N
T13	H	NMe_2	OCH_2CF_3	N
T14	H	OMe	CF_3	N

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T*	R^9	X	Y	Z
T15	H	OEt	NHMe	N
T16	Me	OMe	OMe	CH
T17	Me	OMe	Me	N

Specific information regarding Table 1:

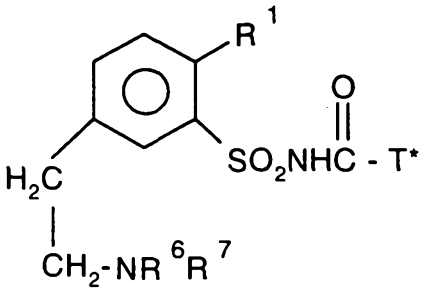
In combined Table 1 there are listed examples of compounds of the formulae (Ia), (Ib), (Ic) and (Id). One line in Table 1 characterizes a definition of the combination of the radicals R^6, R^7 and T* for each of the formulae (Ia), (Ib), (Ic) and (Id), in which R^1 is in each case rigidly defined. The compound of the formula (Ia) in one line is given the example number from the line number with the letter "a"attached. The same applies analogously to compounds of the formulae (Ib), (Ic) and (Id) which, in each line, correspond with the example with "b", "c" and "d", respectively, attached. Any information on physical data, generally the melting point of the examples in question, are given in the box which is located in the line with the example number and in the column underneath the formula number (Ia, Ib, Ic or Id) and which is thus unambiguously assigned to the compound.

A box in the column underneath (Ia) thus exactly defines a compound of the formula (Ia) whose example number is the number given in the column under "No." with the letter "a" attached; the same applies analogously to the examples of the compounds of the formulae (Ib) to (Id).

Unless otherwise specified, the numbers in the boxes in the column underneath (Ia), (Ib), (Ic) or (Id) indicate melting points in degrees Celsius (°C).

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Table 1: Compounds of the formulae (Ia), (Ib), (Ic) and (Id)



R^1 = COOMe (Ia)
R^1 = COOEt (Ib)
R^1 = SO_2Me (Ic)
R^1 = SO_2Et (Id)

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
1 a-d	H	CHO	T1	110-115			
2 a-d	H	"	T2				
3 a-d	H	"	T3				
4 a-d	H	"	T4				
5 a-d	H	"	T5				
6 a-d	H	"	T6				
7 a-d	H	"	T7				
8 a-d	H	"	T8				
9 a-d	H	"	T9				
10 a-d	H	"	T10				
11 a-d	H	"	T11				
12 a-d	H	"	T12				
13 a-d	H	"	T13				
14 a-d	H	"	T14				
15 a-d	H	"	T15				
16 a-d	H	"	T16				
17 a-d	H	"	T17				
18 a-d	H	COMe	T1	199-200			
19 a-d	H	COMe	T2				
20 a-d	H	COMe	T3				
21 a-d	H	COMe	T4				

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Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
22 a-d	H	COMe	T5				
23 a-d	H	COMe	T6				
24 a-d	H	COMe	T7				
25 a-d	H	COMe	T8				
26 a-d	H	COMe	T9				
27 a-d	H	COMe	T10				
28 a-d	H	COMe	T11				
29 a-d	H	COMe	T12				
30 a-d	H	COMe	T13				
31 a-d	H	COMe	T14				
32 a-d	H	COMe	T15				
33 a-d	H	COMe	T16				
34 a-d	H	COMe	T17				
35 a-d	H	COEt	T1				
36 a-d	H	COEt	T2				
37 a-d	H	COEt	T3				
38 a-d	H	COEt	T4				
39 a-d	H	COEt	T5				
40 a-d	H	COEt	T6				
41 a-d	H	COEt	T7				
42 a-d	H	COEt	T8				
43 a-d	H	COEt	T9				
44 a-d	H	COEt	T10				
45 a-d	H	COEt	T11				
46 a-d	H	COEt	T12				
47 a-d	H	COEt	T13				
48 a-d	H	COEt	T14				
49 a-d	H	COEt	T15				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
50 a-d	H	COEt	T16				
51 a-d	H	COEt	T17				
52 a-d	H	$CO_nC_3H_7$	T1				
53 a-d	H	$CO_nC_3H_7$	T2				
54 a-d	H	$CO_nC_3H_7$	T3				
55 a-d	H	$CO_nC_3H_7$	T4				
56 a-d	H	$CO_nC_3H_7$	T5				
57 a-d	H	$CO_nC_3H_7$	T6				
58 a-d	H	$CO_nC_3H_7$	T7				
59 a-d	H	$CO_nC_3H_7$	T8				
60 a-d	H	$CO_nC_3H_7$	T9				
61 a-d	H	$CO_nC_3H_7$	T10				
62 a-d	H	$CO_nC_3H_7$	T11				
63 a-d	H	$CO_nC_3H_7$	T12				
64 a-d	H	$CO_nC_3H_7$	T13				
65 a-d	H	$CO_nC_3H_7$	T14				
66 a-d	H	$CO_nC_3H_7$	T15				
67 a-d	H	$CO_nC_3H_7$	T16				
68 a-d	H	$CO_nC_3H_7$	T17				
69 a-d	H	CO-i-Pr	T1	103-108			
70 a-d	H	CO-i-Pr	T2				
71 a-d	H	CO-i-Pr	T3				
72 a-d	H	CO-i-Pr	T4				
73 a-d	H	CO-i-Pr	T5				
74 a-d	H	CO-i-Pr	T6				
75 a-d	H	CO-i-Pr	T7				
76 a-d	H	CO-i-Pr	T8				
77 a-d	H	CO-i-Pr	T9				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
78 a-d	H	CO-i-Pr	T10				
79 a-d	H	CO-i-Pr	T11				
80 a-d	H	CO-i-Pr	T12				
81 a-d	H	CO-i-Pr	T13				
82 a-d	H	CO-i-Pr	T14				
83 a-d	H	CO-i-Pr	T15				
84 a-d	H	CO-i-Pr	T16				
85 a-d	H	CO-i-Pr	T17				
86 a-d	H	$COCF_3$	T1	200-203			
87 a-d	H	$COCF_3$	T2				
88 a-d	H	$COCF_3$	T3				
89 a-d	H	$COCF_3$	T4				
90 a-d	H	$COCF_3$	T5				
91 a-d	H	$COCF_3$	T6				
92 a-d	H	$COCF_3$	T7				
93 a-d	H	$COCF_3$	T8				
94 a-d	H	$COCF_3$	T9				
95 a-d	H	$COCF_3$	T10				
96 a-d	H	$COCF_3$	T11				
97 a-d	H	$COCF_3$	T12				
98 a-d	H	$COCF_3$	T13				
99 a-d	H	$COCF_3$	T14				
100 a-d	H	$COCF_3$	T15				
101a-d	H	$COCF_3$	T16				
102 a-d	H	$COCF_3$	T17				
103 a-d	H	$COOCH_3$	T1	165-169			
104 a-d	H	$COOCH_3$	T2				
105 a-d	H	$COOCH_3$	T3				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
106 a-d	H	$COOCH_3$	T4				
107 a-d	H	$COOCH_3$	T5				
108 a-d	H	$COOCH_3$	T6				
109 a-d	H	$COOCH_3$	T7				
110 a-d	H	$COOCH_3$	T8				
111 a-d	H	$COOCH_3$	T9				
112 a-d	H	$COOCH_3$	T10				
113 a-d	H	$COOCH_3$	T11				
114 a-d	H	$COOCH_3$	T12				
115 a-d	H	$COOCH_3$	T13				
116 a-d	H	$COOCH_3$	T14				
117 a-d	H	$COOCH_3$	T15				
118 a-d	H	$COOCH_3$	T16				
119 a-d	H	$COOCH_3$	T17				
120 a-d	H	COOEt	T1				
121 a-d	H	"	T2				
122 a-d	H	"	T3				
123 a-d	H	"	T4				
124 a-d	H	"	T5				
125 a-d	H	"	T6				
126 a-d	H	"	T7				
127 a-d	H	"	T8				
128 a-d	H	"	T9				
129 a-d	H	"	T10				
130 a-d	H	"	T11				
131 a-d	H	"	T12				
132 a-d	H	"	T13				
133 a-d	H	"	T14				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
134 a-d	H	"	T15				
135 a-d	H	"	T16				
136 a-d	H	"	T17				
137 a-d	H	SO_2CH_3	T1	112-114			
138 a-d	H	SO_2CH_3	T2				
139 a-d	H	SO_2CH_3	T3				
140 a-d	H	SO_2CH_3	T4				
141 a-d	H	SO_2CH_3	T5				
142 a-d	H	SO_2CH_3	T6				
143 a-d	H	SO_2CH_3	T7				
144 a-d	H	SO_2CH_3	T8				
145 a-d	H	SO_2CH_3	T9				
146 a-d	H	SO_2CH_3	T10				
147 a-d	H	SO_2CH_3	T11				
148 a-d	H	SO_2CH_3	T12				
149 a-d	H	SO_2CH_3	T13				
150 a-d	H	SO_2CH_3	T14				
151 a-d	H	SO_2CH_3	T15				
152 a-d	H	SO_2CH_3	T16				
153 a-d	H	SO_2CH_3	T17				
154 a-d	H	SO_2Et	T1	103-105			
155 a-d	H	SO_2Et	T2				
156 a-d	H	SO_2Et	T3				
157 a-d	H	SO_2Et	T4				
158 a-d	H	SO_2Et	T5				
159 a-d	H	SO_2Et	T6				
160 a-d	H	SO_2Et	T7				
161 a-d	H	SO_2Et	T8				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
162 a-d	H	SO_2Et	T9				
163 a-d	H	SO_2Et	T10				
164 a-d	H	SO_2Et	T11				
165 a-d	H	SO_2Et	T12				
166 a-d	H	SO_2Et	T13				
167 a-d	H	SO_2Et	T14				
168 a-d	H	SO_2Et	T15				
169 a-d	H	SO_2Et	T16				
170 a-d	H	SO_2Et	T17				
171 a-d	H	SO_2nPr	T1				
172 a-d	H	SO_2nPr	T2				
173 a-d	H	SO_2nPr	T3				
174 a-d	H	SO_2nPr	T4				
175 a-d	H	SO_2nPr	T5				
176 a-d	H	SO_2nPr	T6				
177 a-d	H	SO_2nPr	T7				
178 a-d	H	SO_2nPr	T8				
179 a-d	H	SO_2nPr	T9				
180 a-d	H	SO_2nPr	T10				
181 a-d	H	SO_2nPr	T11				
182 a-d	H	SO_2nPr	T12				
183 a-d	H	SO_2nPr	T13				
184 a-d	H	SO_2nPr	T14				
185 a-d	H	SO_2nPr	T15				
186 a-d	H	SO_2nPr	T16				
187 a-d	H	SO_2nPr	T17				
188 a-d	H	SO_2iPr	T1				
189 a-d	H	SO_2iPr	T2				

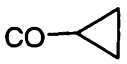
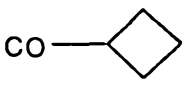
AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
190 a-d	H	SO_2iPr	T3				
191 a-d	H	SO_2iPr	T4				
192 a-d	H	SO_2iPr	T5				
193 a-d	H	SO_2iPr	T6				
194 a-d	H	SO_2iPr	T7				
195 a-d	H	SO_2iPr	T8				
196 a-d	H	SO_2iPr	T9				
197 a-d	H	SO_2iPr	T10				
198 a-d	H	SO_2iPr	T11				
199 a-d	H	SO_2iPr	T12				
200 a-d	H	SO_2iPr	T13				
201 a-d	H	SO_2iPr	T14				
202 a-d	H	SO_2iPr	T15				
203 a-d	H	SO_2iPr	T16				
204 a-d	H	SO_2iPr	T17				
205 a-d	H	$ClCH_2CO$-	T1				
206 a-d	H	$ClCH_2CO$-	T2				
207 a-d	H	$ClCH_2CO$-	T3				
208 a-d	H	$ClCH_2CO$-	T9				
209 a-d	H	$ClCH_2CO$-	T10				
210 a-d	H	$ClCH_2CO$-	T11				
211 a-d	H	$ClCH_2CO$-	T14				
212 a-d	H	$ClCH_2CO$-	T16				
213 a-d	H	$ClCH_2CO$-	T17				
214 a-d	H	Cl_2CHCO-	T1				
215 a-d	H	Cl_2CHCO-	T2				
216 a-d	H	Cl_2CHCO-	T3				
217 a-d	H	Cl_2CHCO-	T9				

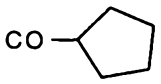
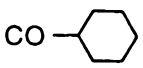
AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
218 a-d	H	Cl_2CHCO-	T10				
219 a-d	H	Cl_2CHCO-	T11				
220 a-d	H	Cl_2CHCO-	T14				
221 a-d	H	Cl_2CHCO-	T16				
222 a-d	H	Cl_2CHCO-	T17				
223 a-d	H	Cl_3CCO-	T1				
224 a-d	H	Cl_3CCO-	T2				
225 a-d	H	Cl_3CCO-	T3				
226 a-d	H	Cl_3CCO-	T9				
227 a-d	H	Cl_3CCO-	T10				
228 a-d	H	Cl_3CCO-	T11				
229 a-d	H	Cl_3CCO-	T14				
230 a-d	H	Cl_3CCO-	T16				
231 a-d	H	Cl_3CCO-	T17				
232 a-d	H	CH_3OCH_2CO	T1				
233 a-d	H	CH_3OCH_2CO	T2				
234 a-d	H	CH_3OCH_2CO	T3				
235 a-d	H	CH_3OCH_2CO	T9				
236 a-d	H	CH_3OCH_2CO	T10				
237 a-d	H	CH_3OCH_2CO	T11				
238 a-d	H	CH_3OCH_2CO	T14				
239 a-d	H	CH_3OCH_2CO	T16				
240 a-d	H	CH_3OCH_2CO	T17				
241 a-d	H	CH_2=CHCO	T1				
242 a-d	H	CH_2=CHCO	T2				
243 a-d	H	CH_2=CHCO	T3				
244 a-d	H	CH_2=CHCO	T9				
245 a-d	H	CH_2=CHCO	T10				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
246 a-d	H	CH_2=CHCO	T11				
247 a-d	H	CH_2=CHCO	T14				
248 a-d	H	CH_2=CHCO	T16				
249 a-d	H	CH_2=CHCO	T17				
250 a-d	H	CH≡CCO	T1				
251 a-d	H	CH≡CCO	T2				
252 a-d	H	CH≡CCO	T3				
253 a-d	H	CH≡CCO	T9				
254 a-d	H	CH≡CCO	T10				
255 a-d	H	CH≡CCO	T11				
256 a-d	H	CH≡CCO	T14				
257 a-d	H	CH≡CCO	T16				
258 a-d	H	CH≡CCO	T17				
259 a-d	H		T1	180-181			
260 a-d	H	"	T2				
261 a-d	H	"	T3				
262 a-d	H	"	T9				
263 a-d	H	"	T10				
264 a-d	H	"	T11				
265 a-d	H	"	T14				
266 a-d	H	"	T16				
267 a-d	H	"	T17				
268 a-d	H		T1				
269 a-d	H	"	T2				
270 a-d	H	"	T3				
271 a-d	H	"	T9				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
272 a-d	H	"	T10				
273 a-d	H	"	T11				
274 a-d	H	"	T14				
275 a-d	H	"	T16				
276 a-d	H	"	T17				
277 a-d	H		T1				
278 a-d	H	"	T2				
279 a-d	H	"	T3				
280 a-d	H	"	T9				
281 a-d	H	"	T10				
282 a-d	H	"	T11				
283 a-d	H	"	T14				
284 a-d	H	"	T16				
285 a-d	H	"	T17				
286 a-d	H		T1				
287 a-d	H	"	T2				
288 a-d	H	"	T3				
289 a-d	H	"	T9				
290 a-d	H	"	T10				
291 a-d	H	"	T11				
292 a-d	H	"	T14				
293 a-d	H	"	T16				
294 a-d	H	"	T17				
295 a-d	H	SO_2CF_3	T1				
296 a-d	H	SO_2CF_3	T2				
297 a-d	H	SO_2CF_3	T3				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
298 a-d	H	SO_2CF_3	T9				
299 a-d	H	SO_2CF_3	T10				
300 a-d	H	SO_2CF_3	T11				
301 a-d	H	SO_2CF_3	T14				
302 a-d	H	SO_2CF_3	T16				
303 a-d	H	SO_2CF_3	T17				
304 a-d	H	SO_2CH_2F	T1				
305 a-d	H	SO_2CH_2F	T2				
306 a-d	H	SO_2CH_2F	T3				
307 a-d	H	SO_2CH_2F	T9				
308 a-d	H	SO_2CH_2F	T10				
309 a-d	H	SO_2CH_2F	T11				
310 a-d	H	SO_2CH_2F	T14				
311 a-d	H	SO_2CH_2F	T16				
312 a-d	H	SO_2CH_2F	T17				
313 a-d	H	SO_2CH_2Cl	T1				
314 a-d	H	SO_2CH_2Cl	T2				
315 a-d	H	SO_2CH_2Cl	T3				
316 a-d	H	SO_2CH_2Cl	T9				
317 a-d	H	SO_2CH_2Cl	T10				
318 a-d	H	SO_2CH_2Cl	T11				
319 a-d	H	SO_2CH_2Cl	T14				
320 a-d	H	SO_2CH_2Cl	T16				
321 a-d	H	SO_2CH_2Cl	T17				
322 a-d	H	SO_2CHCl_2	T1				
323 a-d	H	SO_2CHCl_2	T2				
324 a-d	H	SO_2CHCl_2	T3				
325 a-d	H	SO_2CHCl_2	T9				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
326 a-d	H	SO_2CHCl_2	T10				
327 a-d	H	SO_2CHCl_2	T11				
328 a-d	H	SO_2CHCl_2	T14				
329 a-d	H	SO_2CHCl_2	T16				
330 a-d	H	SO_2CHCl_2	T17				
331 a-d	H	SO_2CCl_3	T1				
332 a-d	H	SO_2CCl_3	T2				
333 a-d	H	SO_2CCl_3	T3				
334 a-d	H	SO_2CCl_3	T9				
335 a-d	H	SO_2CCl_3	T10				
336 a-d	H	SO_2CCl_3	T11				
337 a-d	H	SO_2CCl_3	T14				
338 a-d	H	SO_2CCl_3	T16				
339 a-d	H	SO_2CCl_3	T17				
340 a-d	H	SO_2n-Bu	T1				
341 a-d	H	SO_2n-Bu	T2				
342 a-d	H	SO_2n-Bu	T3				
343 a-d	H	SO_2n-Bu	T9				
344 a-d	H	SO_2n-Bu	T10				
345 a-d	H	SO_2n-Bu	T11				
346 a-d	H	SO_2n-Bu	T14				
347 a-d	H	SO_2n-Bu	T16				
348 a-d	H	SO_2n-Bu	T17				
349 a-d	H	$SO_2CH_2CF_3$	T1				
350 a-d	H	$SO_2CH_2CF_3$	T2				
351 a-d	H	$SO_2CH_2CF_3$	T3				
352 a-d	H	$SO_2CH_2CF_3$	T9				
353 a-d	H	$SO_2CH_2CF_3$	T10				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
354 a-d	H	$SO_2CH_2CF_3$	T11				
355 a-d	H	$SO_2CH_2CF_3$	T14				
356 a-d	H	$SO_2CH_2CF_3$	T16				
357 a-d	H	$SO_2CH_2CF_3$	T17				
358 a-d	H	SO_2NHCH_3	T1				
359 a-d	H	SO_2NHCH_3	T2				
360 a-d	H	SO_2NHCH_3	T3				
361 a-d	H	SO_2NHCH_3	T9				
362 a-d	H	SO_2NHCH_3	T10				
363 a-d	H	SO_2NHCH_3	T11				
364 a-d	H	SO_2NHCH_3	T14				
365 a-d	H	SO_2NHCH_3	T16				
366 a-d	H	SO_2NHCH_3	T17				
367 a-d	H	$SO_2N(CH_3)_2$	T1				
368 a-d	H	$SO_2N(CH_3)_2$	T2				
369 a-d	H	$SO_2N(CH_3)_2$	T3				
370 a-d	H	$SO_2N(CH_3)_2$	T9				
371 a-d	H	$SO_2N(CH_3)_2$	T10				
372 a-d	H	$SO_2N(CH_3)_2$	T11				
373 a-d	H	$SO_2N(CH_3)_2$	T14				
374 a-d	H	$SO_2N(CH_3)_2$	T16				
375 a-d	H	$SO_2N(CH_3)_2$	T17				
376 a-d	H	$(CH_3)_3COCO$	T1				
377 a-d	H	$(CH_3)_3COCO$	T2				
378 a-d	H	$(CH_3)_3COCO$	T3				
379 a-d	H	$(CH_3)_3COCO$	T9				
380 a-d	H	$(CH_3)_3COCO$	T10				
381 a-d	H	$(CH_3)_3COCO$	T11				

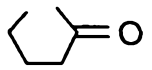
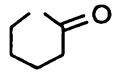
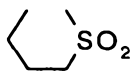
AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
382 a-d	H	$(CH_3)_3COCO$	T14				
383 a-d	H	$(CH_3)_3COCO$	T16				
384 a-d	H	$(CH_3)_3COCO$	T17				
385 a-d	H	PhCO	T1				
386 a-d	H	PhCO	T2				
387 a-d	H	PhCO	T3				
388 a-d	H	PhCO	T9				
389 a-d	H	PhCO	T10				
390 a-d	H	PhCO	T11				
391 a-d	H	PhCO	T14				
392 a-d	H	PhCO	T16				
393 a-d	H	PhCO	T17				
394 a-d	H	$PhSO_2$	T1				
395 a-d	H	$PhSO_2$	T2				
396 a-d	H	$PhSO_2$	T3				
387 a-d	H	$PhSO_2$	T9				
398 a-d	H	$PhSO_2$	T10				
399 a-d	H	$PhSO_2$	T11				
400 a-d	H	$PhSO_2$	T14				
401 a-d	H	$PhSO_2$	T16				
402 a-d	H	$PhSO_2$	T17				
403 a-d	H	MeNHCO	T1				
404 a-d	H	MeNHCO	T2				
405 a-d	H	MeNHCO	T3				
406 a-d	H	MeNHCO	T9				
407 a-d	H	MeNHCO	T10				
408 a-d	H	MeNHCO	T11				
409 a-d	H	MeNHCO	T14				

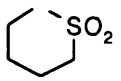
AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
410 a-d	H	MeNHCO	T16				
411 a-d	H	MeNHCO	T17				
412 a-d	H	EtNHCO	T1				
413 a-d	H	EtNHCO	T2				
414 a-d	H	EtNHCO	T3				
415 a-d	H	EtNHCO	T9				
416 a-d	H	EtNHCO	T10				
417 a-d	H	EtNHCO	T11				
418 a-d	H	EtNHCO	T14				
419 a-d	H	EtNHCO	T16				
420 a-d	H	EtNHCO	T17				
421 a-d	H	MeNHCS	T1				
422 a-d	H	MeNHCS	T2				
423 a-d	H	MeNHCS	T3				
424 a-d	H	MeNHCS	T9				
425 a-d	H	MeNHCS	T10				
426 a-d	H	MeNHCS	T11				
427 a-d	H	MeNHCS	T14				
428 a-d	H	MeNHCS	T16				
429 a-d	H	MeNHCS	T17				
430 a-d	H	EtNHCS	T1				
431 a-d	H	EtNHCS	T2				
432 a-d	H	EtNHCS	T3				
433 a-d	H	EtNHCS	T9				
434 a-d	H	EtNHCS	T10				
435 a-d	H	EtNHCS	T11				
436 a-d	H	EtNHCS	T14				
437 a-d	H	EtNHCS	T16				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
438 a-d	H	EtNHCS	T17				
439 a-d			T1				
440 a-d	"		T2				
441 a-d	"		T3				
442 a-d	"		T9				
443 a-d	"		T10				
444 a-d	"		T11				
445 a-d	"		T14				
446 a-d	"		T16				
447 a-d	"		T17				
448 a-d			T1				
449 a-d	"		T2				
450 a-d	"		T3				
451 a-d	"		T9				
452 a-d	"		T10				
453 a-d	"		T11				
454 a-d	"		T14				
455 a-d	"		T16				
456 a-d	"		T17				
457 a-d			T1				
458 a-d	"		T2				
459 a-d	"		T3				
460 a-d	"		T9				
461 a-d	"		T10				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
462 a-d	"		T11				
463 a-d	"		T14				
464 a-d	"		T16				
465 a-d	"		T17				
466 a-d			T1				
467 a-d	"		T2				
468 a-d	"		T3				
469 a-d	"		T9				
470 a-d	"		T10				
471 a-d	"		T11				
472 a-d	"		T14				
473 a-d	"		T16				
474 a-d	"		T17				
475 a-d			T1				
476 a-d	"		T2				
477 a-d	"		T3				
478 a-d	"		T9				
479 a-d	"		T10				
480 a-d	"		T11				
481 a-d	"		T14				
482 a-d	"		T16				
483 a-d	"		T17				
484 a-d	H	COSMe	T1				
485 a-d	H	COSMe	T2				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
486 a-d	H	COSMe	T3				
487 a-d	H	COSMe	T9				
488 a-d	H	COSMe	T10				
489 a-d	H	COSMe	T11				
490 a-d	H	COSMe	T14				
491 a-d	H	COSMe	T16				
492 a-d	H	COSMe	T17				
493 a-d	H	CSOMe	T1				
494 a-d	H	CSOMe	T2				
495 a-d	H	CSOMe	T3				
496 a-d	H	CSOMe	T9				
497 a-d	H	CSOMe	T10				
498 a-d	H	CSOMe	T11				
499 a-d	H	CSOMe	T14				
500 a-d	H	CSOMe	T16				
501 a-d	H	CSOMe	T17				
502 a-d	H	CSSMe	T1				
503 a-d	H	CSSMe	T2				
504 a-d	H	CSSMe	T3				
505 a-d	H	CSSMe	T9				
506 a-d	H	CSSMe	T10				
507 a-d	H	CSSMe	T11				
508 a-d	H	CSSMe	T14				
509 a-d	H	CSSMe	T16				
510 a-d	H	CSSMe	T17				
511 a-d	H	COCOOMe	T1				
512 a-d	H	COCOOMe	T2				
513 a-d	H	COCOOMe	T3				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
514 a-d	H	COCOOMe	T9				
515 a-d	H	COCOOMe	T10				
516 a-d	H	COCOOMe	T11				
517 a-d	H	COCOOMe	T14				
518 a-d	H	COCOOMe	T16				
519 a-d	H	COCOOMe	T17				
520 a-d	H	i-C_3H_7OCO	T1				
521 a-d	H	i-C_3H_7OCO	T2				
522 a-d	H	i-C_3H_7OCO	T3				
523 a-d	H	i-C_3H_7OCO	T9				
524 a-d	H	i-C_3H_7OCO	T10				
525 a-d	H	i-C_3H_7OCO	T11				
526 a-d	H	i-C_3H_7OCO	T14				
527 a-d	H	i-C_3H_7OCO	T16				
528 a-d	H	i-C_3H_7OCO	T17				
529 a-d	H	CHO	T1	Na salt 75-77			
530 a-d	H	Me_2CHCO	T1	Na salt 179-183			
531 a-d	H	SO_2Et	T1	Na salt 154-160			
532 a-d	Me	CHO	T1	179-181			
533 a-d	Me	CHO	T2				
534 a-d	Me	CHO	T3				
535 a-d	Me	CHO	T4				
536 a-d	Me	CHO	T5				
537 a-d	Me	CHO	T6				
538 a-d	Me	CHO	T7				
539 a-d	Me	CHO	T8				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
540 a-d	Me	CHO	T9				
541 a-d	Me	CHO	T10				
542 a-d	Me	CHO	T11				
543 a-d	Me	CHO	T12				
544 a-d	Me	CHO	T13				
545 a-d	Me	CHO	T14				
546 a-d	Me	CHO	T15				
547 a-d	Me	CHO	T16				
548 a-d	Me	CHO	T17				
549 a-d	Me	$COCH_3$	T1	217-218			
550 a-d	Me	$COCH_3$	T2				
551 a-d	Me	$COCH_3$	T3				
552 a-d	Me	$COCH_3$	T4				
553 a-d	Me	$COCH_3$	T5				
554 a-d	Me	$COCH_3$	T6				
555 a-d	Me	$COCH_3$	T7				
556 a-d	Me	$COCH_3$	T8				
557 a-d	Me	$COCH_3$	T9				
558 a-d	Me	$COCH_3$	T10				
559 a-d	Me	$COCH_3$	T11				
560 a-d	Me	$COCH_3$	T12				
561 a-d	Me	$COCH_3$	T13				
562 a-d	Me	$COCH_3$	T14				
563 a-d	Me	$COCH_3$	T15				
564 a-d	Me	$COCH_3$	T16				
565 a-d	Me	$COCH_3$	T17				
566 a-d	Me	COEt	T1	163-165			
567 a-d	Me	COEt	T2				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
568 a-d	Me	COEt	T3				
569 a-d	Me	COEt	T4				
570 a-d	Me	COEt	T5				
571 a-d	Me	COEt	T6				
572 a-d	Me	COEt	T7				
573 a-d	Me	COEt	T8				
574 a-d	Me	COEt	T9				
575 a-d	Me	COEt	T10				
576 a-d	Me	COEt	T11				
577 a-d	Me	COEt	T12				
578 a-d	Me	COEt	T13				
579 a-d	Me	COEt	T14				
580 a-d	Me	COEt	T15				
581 a-d	Me	COEt	T16				
582 a-d	Me	COEt	T17				
583 a-d	Me	$CO_nC_3H_7$	T1				
584 a-d	Me	$CO_nC_3H_7$	T2				
585 a-d	Me	$CO_nC_3H_7$	T3				
586 a-d	Me	$CO_nC_3H_7$	T4				
587 a-d	Me	$CO_nC_3H_7$	T5				
588 a-d	Me	$CO_nC_3H_7$	T6				
589 a-d	Me	$CO_nC_3H_7$	T7				
590 a-d	Me	$CO_nC_3H_7$	T8				
591 a-d	Me	$CO_nC_3H_7$	T9				
592 a-d	Me	$CO_nC_3H_7$	T10				
593 a-d	Me	$CO_nC_3H_7$	T11				
594 a-d	Me	$CO_nC_3H_7$	T12				
595 a-d	Me	$CO_nC_3H_7$	T13				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
596 a-d	Me	$CO_nC_3H_7$	T14				
597 a-d	Me	$CO_nC_3H_7$	T15				
598 a-d	Me	$CO_nC_3H_7$	T16				
599 a-d	Me	$CO_nC_3H_7$	T17				
600 a-d	Me	CO-i-C_3H_7	T1				
601 a-d	Me	CO-i-C_3H_7	T2				
602 a-d	Me	CO-i-C_3H_7	T3				
603 a-d	Me	CO-i-C_3H_7	T4				
604 a-d	Me	CO-i-C_3H_7	T5				
605 a-d	Me	CO-i-C_3H_7	T6				
606 a-d	Me	CO-i-C_3H_7	T7				
607 a-d	Me	CO-i-C_3H_7	T8				
608 a-d	Me	CO-i-C_3H_7	T9				
609 a-d	Me	CO-i-C_3H_7	T10				
610 a-d	Me	CO-i-C_3H_7	T11				
611 a-d	Me	CO-i-C_3H_7	T12				
612 a-d	Me	CO-i-C_3H_7	T13				
613 a-d	Me	CO-i-C_3H_7	T14				
614 a-d	Me	CO-i-C_3H_7	T15				
615 a-d	Me	CO-i-C_3H_7	T16				
616 a-d	Me	CO-i-C_3H_7	T17				
617 a-d	Me	$COCF_3$	T1				
618 a-d	Me	$COCF_3$	T2				
619 a-d	Me	$COCF_3$	T3				
620 a-d	Me	$COCF_3$	T4				
621 a-d	Me	$COCF_3$	T5				
622 a-d	Me	$COCF_3$	T6				
623 a-d	Me	$COCF_3$	T7				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
624 a-d	Me	$COCF_3$	T8				
625 a-d	Me	$COCF_3$	T9				
626 a-d	Me	$COCF_3$	T10				
627 a-d	Me	$COCF_3$	T11				
628 a-d	Me	$COCF_3$	T12				
629 a-d	Me	$COCF_3$	T13				
630 a-d	Me	$COCF_3$	T14				
631 a-d	Me	$COCF_3$	T15				
632 a-d	Me	$COCF_3$	T16				
633 a-d	Me	$COCF_3$	T17				
634 a-d	Me	COOMe	T1	181-183			
635 a-d	Me	COOMe	T2				
636 a-d	Me	COOMe	T3				
637 a-d	Me	COOMe	T4				
638 a-d	Me	COOMe	T5				
639 a-d	Me	COOMe	T6				
640 a-d	Me	COOMe	T7				
641 a-d	Me	COOMe	T8				
642 a-d	Me	COOMe	T9				
643 a-d	Me	COOMe	T10				
644 a-d	Me	COOMe	T11				
645 a-d	Me	COOMe	T12				
646 a-d	Me	COOMe	T13				
647a-d	Me	COOMe	T14				
648 a-d	Me	COOMe	T15				
649 a-d	Me	COOMe	T16				
650 a-d	Me	COOMe	T17				
651 a-d	Me	COOEt	T1				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
652 a-d	Me	COOEt	T2				
653 a-d	Me	COOEt	T3				
654 a-d	Me	COOEt	T4				
655 a-d	Me	COOEt	T5				
656 a-d	Me	COOEt	T6				
657 a-d	Me	COOEt	T7				
658 a-d	Me	COOEt	T8				
659 a-d	Me	COOEt	T9				
660 a-d	Me	COOEt	T10				
661 a-d	Me	COOEt	T11				
662 a-d	Me	COOEt	T12				
663 a-d	Me	COOEt	T13				
664 a-d	Me	COOEt	T14				
665 a-d	Me	COOEt	T15				
666 a-d	Me	COOEt	T16				
667 a-d	Me	COOEt	T17				
668 a-d	Me	SO_2CH_3	T1	201-203			
669 a-d	Me	SO_2CH_3	T2				
670 a-d	Me	SO_2CH_3	T3				
671 a-d	Me	SO_2CH_3	T4				
672 a-d	Me	SO_2CH_3	T5				
673 a-d	Me	SO_2CH_3	T6				
674 a-d	Me	SO_2CH_3	T7				
675 a-d	Me	SO_2CH_3	T8				
676 a-d	Me	SO_2CH_3	T9				
677 a-d	Me	SO_2CH_3	T10				
678 a-d	Me	SO_2CH_3	T11				
679 a-d	Me	SO_2CH_3	T12				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
680 a-d	Me	SO_2CH_3	T13				
681 a-d	Me	SO_2CH_3	T14				
682 a-d	Me	SO_2CH_3	T15				
683 a-d	Me	SO_2CH_3	T16				
684 a-d	Me	SO_2CH_3	T17				
685 a-d	Me	SO_2Et	T1	149-151			
686 a-d	Me	SO_2Et	T2				
687 a-d	Me	SO_2Et	T3				
688 a-d	Me	SO_2Et	T4				
689 a-d	Me	SO_2Et	T5				
690 a-d	Me	SO_2Et	T6				
691 a-d	Me	SO_2Et	T7				
692 a-d	Me	SO_2Et	T8				
693 a-d	Me	SO_2Et	T9				
694 a-d	Me	SO_2Et	T10				
695 a-d	Me	SO_2Et	T11				
696 a-d	Me	SO_2Et	T12				
697 a-d	Me	SO_2Et	T13				
698 a-d	Me	SO_2Et	T14				
699 a-d	Me	SO_2Et	T15				
700 a-d	Me	SO_2Et	T16				
701 a-d	Me	SO_2Et	T17				
702 a-d	Me	SO_2nPr	T1				
703 a-d	Me	SO_2nPr	T2				
704 a-d	Me	SO_2nPr	T3				
705 a-d	Me	SO_2nPr	T4				
706 a-d	Me	SO_2nPr	T5				
707 a-d	Me	SO_2nPr	T6				

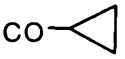
AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
708 a-d	Me	SO_2nPr	T7				
709 a-d	Me	SO_2nPr	T8				
710 a-d	Me	SO_2nPr	T9				
711 a-d	Me	SO_2nPr	T10				
712 a-d	Me	SO_2nPr	T11				
713 a-d	Me	SO_2nPr	T12				
714 a-d	Me	SO_2nPr	T13				
715 a-d	Me	SO_2nPr	T14				
716 a-d	Me	SO_2nPr	T15				
717 a-d	Me	SO_2nPr	T16				
718 a-d	Me	SO_2nPr	T17				
719 a-d	Me	SO_2iPr	T1				
720 a-d	Me	SO_2iPr	T2				
721 a-d	Me	SO_2iPr	T3				
722 a-d	Me	SO_2iPr	T4				
723 a-d	Me	SO_2iPr	T5				
724 a-d	Me	SO_2iPr	T6				
725 a-d	Me	SO_2iPr	T7				
726 a-d	Me	SO_2iPr	T8				
727 a-d	Me	SO_2iPr	T9				
728 a-d	Me	SO_2iPr	T10				
729 a-d	Me	SO_2iPr	T11				
730 a-d	Me	SO_2iPr	T12				
731 a-d	Me	SO_2iPr	T13				
732 a-d	Me	SO_2iPr	T14				
733 a-d	Me	SO_2iPr	T15				
734 a-d	Me	SO_2iPr	T16				
735 a-d	Me	SO_2iPr	T17				

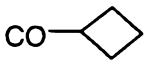
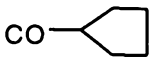
AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
736 a-d	Me	$ClCH_2CO$	T1				
737 a-d	Me	$ClCH_2CO$	T2				
738 a-d	Me	$ClCH_2CO$	T3				
739 a-d	Me	$ClCH_2CO$	T9				
740 a-d	Me	$ClCH_2CO$	T10				
741 a-d	Me	$ClCH_2CO$	T11				
742 a-d	Me	$ClCH_2CO$	T14				
743 a-d	Me	$ClCH_2CO$	T16				
744 a-d	Me	$ClCH_2CO$	T17				
745 a-d	Me	Cl_2CHCO	T1				
746 a-d	Me	Cl_2CHCO	T2				
747 a-d	Me	Cl_2CHCO	T3				
748 a-d	Me	Cl_2CHCO	T9				
749 a-d	Me	Cl_2CHCO	T10				
750 a-d	Me	Cl_2CHCO	T11				
751 a-d	Me	Cl_2CHCO	T14				
752 a-d	Me	Cl_2CHCO	T16				
753 a-d	Me	Cl_2CHCO	T17				
754 a-d	Me	Cl_3CCO	T1				
755 a-d	Me	Cl_3CCO	T2				
756 a-d	Me	Cl_3CCO	T3				
757 a-d	Me	Cl_3CCO	T9				
758 a-d	Me	Cl_3CCO	T10				
759 a-d	Me	Cl_3CCO	T11				
760 a-d	Me	Cl_3CCO	T14				
761 a-d	Me	Cl_3CCO	T16				
762 a-d	Me	Cl_3CCO	T17				
763 a-d	Me	CH_3OCH_2CO	T1				

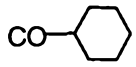
AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
764 a-d	Me	CH_3OCH_2CO	T2				
765 a-d	Me	CH_3OCH_2CO	T3				
766 a-d	Me	CH_3OCH_2CO	T9				
767 a-d	Me	CH_3OCH_2CO	T10				
768 a-d	Me	CH_3OCH_2CO	T11				
769 a-d	Me	CH_3OCH_2CO	T14				
770 a-d	Me	CH_3OCH_2CO	T16				
771 a-d	Me	CH_3OCH_2CO	T17				
772 a-d	Me	CH_2=CHCO	T1				
773 a-d	Me	CH_2=CHCO	T2				
774 a-d	Me	CH_2=CHCO	T3				
775 a-d	Me	CH_2=CHCO	T9				
776 a-d	Me	CH_2=CHCO	T10				
777 a-d	Me	CH_2=CHCO	T11				
778 a-d	Me	CH_2=CHCO	T14				
779 a-d	Me	CH_2=CHCO	T16				
780 a-d	Me	CH_2=CHCO	T17				
781 a-d	Me	CH≡CCO	T1				
782 a-d	Me	CH≡CCO	T2				
783 a-d	Me	CH≡CCO	T3				
784 a-d	Me	CH≡CCO	T9				
785 a-d	Me	CH≡CCO	T10				
786 a-d	Me	CH≡CCO	T11				
787 a-d	Me	CH≡CCO	T14				
788 a-d	Me	CH≡CCO	T16				
789 a-d	Me	CH≡CCO	T17				
790 a-d	Me		T1				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
791 a-d	Me	"	T2				
792 a-d	Me	"	T3				
793 a-d	Me	"	T9				
794 a-d	Me	"	T10				
795 a-d	Me	"	T11				
796 a-d	Me	"	T14				
797 a-d	Me	"	T16				
798 a-d	Me	"	T17				
799 a-d	Me		T1				
800 a-d	Me	"	T2				
801 a-d	Me	"	T3				
802 a-d	Me	"	T9				
803 a-d	Me	"	T10				
804 a-d	Me	"	T11				
805 a-d	Me	"	T14				
806 a-d	Me	"	T16				
807 a-d	Me	"	T17				
808 a-d	Me		T1				
809 a-d	Me	"	T2				
810 a-d	Me	"	T3				
811 a-d	Me	"	T9				
812 a-d	Me	"	T10				
813 a-d	Me	"	T11				
814 a-d	Me	"	T14				
815 a-d	Me	"	T16				
816 a-d	Me	"	T17				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
817 a-d	Me		T1				
818 a-d	Me	"	T2				
819 a-d	Me	"	T3				
820 a-d	Me	"	T9				
821 a-d	Me	"	T10				
822 a-d	Me	"	T11				
823 a-d	Me	"	T14				
824 a-d	Me	"	T16				
825 a-d	Me	"	T17				
826 a-d	Me	SO_2CF_3	T1				
827 a-d	Me	SO_2CF_3	T2				
828 a-d	Me	SO_2CF_3	T3				
829 a-d	Me	SO_2CF_3	T9				
830 a-d	Me	SO_2CF_3	T10				
831 a-d	Me	SO_2CF_3	T11				
832 a-d	Me	SO_2CF_3	T14				
833 a-d	Me	SO_2CF_3	T16				
834 a-d	Me	SO_2CF_3	T17				
835 a-d	Me	SO_2CH_2F	T1	164-166			
836 a-d	Me	SO_2CH_2F	T2				
837 a-d	Me	SO_2CH_2F	T3				
838 a-d	Me	SO_2CH_2F	T9				
839 a-d	Me	SO_2CH_2F	T10				
840 a-d	Me	SO_2CH_2F	T11				
841 a-d	Me	SO_2CH_2F	T14				
842 a-d	Me	SO_2CH_2F	T16				
843 a-d	Me	SO_2CH_2F	T17				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
844 a-d	Me	SO_2CH_2Cl	T1				
845 a-d	Me	SO_2CH_2Cl	T2				
846 a-d	Me	SO_2CH_2Cl	T3				
847 a-d	Me	SO_2CH_2Cl	T9				
848 a-d	Me	SO_2CH_2Cl	T10				
849 a-d	Me	SO_2CH_2Cl	T11				
850 a-d	Me	SO_2CH_2Cl	T14				
851 a-d	Me	SO_2CH_2Cl	T16				
852 a-d	Me	SO_2CH_2Cl	T17				
853 a-d	Me	SO_2CHCl_2	T1				
854 a-d	Me	SO_2CHCl_2	T2				
855 a-d	Me	SO_2CHCl_2	T3				
856 a-d	Me	SO_2CHCl_2	T9				
857 a-d	Me	SO_2CHCl_2	T10				
858 a-d	Me	SO_2CHCl_2	T11				
859 a-d	Me	SO_2CHCl_2	T14				
860 a-d	Me	SO_2CHCl_2	T16				
861 a-d	Me	SO_2CHCl_2	T17				
862 a-d	Me	SO_2CCl_3	T1				
863 a-d	Me	SO_2CCl_3	T2				
864 a-d	Me	SO_2CCl_3	T3				
865 a-d	Me	SO_2CCl_3	T9				
866 a-d	Me	SO_2CCl_3	T10				
867 a-d	Me	SO_2CCl_3	T11				
868 a-d	Me	SO_2CCl_3	T14				
869 a-d	Me	SO_2CCl_3	T16				
870 a-d	Me	SO_2CCl_3	T17				
871 a-d	Me	SO_2nBu	T1				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
872 a-d	Me	SO_2nBu	T2				
873 a-d	Me	SO_2nBu	T3				
874 a-d	Me	SO_2nBu	T9				
875 a-d	Me	SO_2nBu	T10				
87 a-d6	Me	SO_2nBu	T11				
877 a-d	Me	SO_2nBu	T14				
878 a-d	Me	SO_2nBu	T16				
879 a-d	Me	SO_2nBu	T17				
880 a-d	Me	$SO_2CH_2CF_3$	T1				
881 a-d	Me	$SO_2CH_2CF_3$	T2				
882 a-d	Me	$SO_2CH_2CF_3$	T3				
883 a-d	Me	$SO_2CH_2CF_3$	T9				
884 a-d	Me	$SO_2CH_2CF_3$	T10				
885 a-d	Me	$SO_2CH_2CF_3$	T11				
886 a-d	Me	$SO_2CH_2CF_3$	T14				
887 a-d	Me	$SO_2CH_2CF_3$	T16				
888 a-d	Me	$SO_2CH_2CF_3$	T17				
889 a-d	Me	SO_2NHCH_3	T1				
890 a-d	Me	SO_2NHCH_3	T2				
891 a-d	Me	SO_2NHCH_3	T3				
892 a-d	Me	SO_2NHCH_3	T9				
893 a-d	Me	SO_2NHCH_3	T10				
894 a-d	Me	SO_2NHCH_3	T11				
895 a-d	Me	SO_2NHCH_3	T14				
896 a-d	Me	SO_2NHCH_3	T16				
897 a-d	Me	SO_2NHCH_3	T17				
898 a-d	Me	$SO_2N(CH_3)_2$	T1				
899 a-d	Me	$SO_2N(CH_3)_2$	T2				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
900 a-d	Me	$SO_2N(CH_3)_2$	T3				
901 a-d	Me	$SO_2N(CH_3)_2$	T9				
902 a-d	Me	$SO_2N(CH_3)_2$	T10				
903 a-d	Me	$SO_2N(CH_3)_2$	T11				
904 a-d	Me	$SO_2N(CH_3)_2$	T14				
905 a-d	Me	$SO_2N(CH_3)_2$	T16				
906 a-d	Me	$SO_2N(CH_3)_2$	T17				
907 a-d	Me	$(CH_3)_3COCO$	T1				
908 a-d	Me	$(CH_3)_3COCO$	T2				
909 a-d	Me	$(CH_3)_3COCO$	T3				
910 a-d	Me	$(CH_3)_3COCO$	T9				
911 a-d	Me	$(CH_3)_3COCO$	T10				
912 a-d	Me	$(CH_3)_3COCO$	T11				
913 a-d	Me	$(CH_3)_3COCO$	T14				
914 a-d	Me	$(CH_3)_3COCO$	T16				
915 a-d	Me	$(CH_3)_3COCO$	T17				
916 a-d	Me	PhCO	T1				
917 a-d	Me	PhCO	T2				
918 a-d	Me	PhCO	T3				
919 a-d	Me	PhCO	T9				
920 a-d	Me	PhCO	T10				
921 a-d	Me	PhCO	T11				
922 a-d	Me	PhCO	T14				
923 a-d	Me	PhCO	T16				
924 a-d	Me	PhCO	T17				
925 a-d	Me	$PhSO_2$	T1				
926 a-d	Me	PhSO2	T2				
927 a-d	Me	PhSO2	T3				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
928 a-d	Me	PhSO2	T9				
929 a-d	Me	PhSO2	T10				
930 a-d	Me	PhSO2	T11				
931 a-d	Me	PhSO2	T14				
932 a-d	Me	PhSO2	T16				
933 a-d	Me	PhSO2	T17				
934 a-d	Me	MeNHCO	T1				
935 a-d	Me	MeNHCO	T2				
936 a-d	Me	MeNHCO	T3				
937 a-d	Me	MeNHCO	T9				
938 a-d	Me	MeNHCO	T10				
939 a-d	Me	MeNHCO	T11				
940 a-d	Me	MeNHCO	T14				
941 a-d	Me	MeNHCO	T16				
942 a-d	Me	MeNHCO	T17				
943 a-d	Me	EtNHCO	T1				
944 a-d	Me	EtNHCO	T2				
945 a-d	Me	EtNHCO	T3				
946 a-d	Me	EtNHCO	T9				
947 a-d	Me	EtNHCO	T10				
948 a-d	Me	EtNHCO	T11				
949 a-d	Me	EtNHCO	T14				
950 a-d	Me	EtNHCO	T16				
951 a-d	Me	EtNHCO	T17				
952 a-d	Me	MeNHCS	T1				
953 a-d	Me	MeNHCS	T2				
954 a-d	Me	MeNHCS	T3				
955 a-d	Me	MeNHCS	T9				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
956 a-d	Me	MeNHCS	T10				
957 a-d	Me	MeNHCS	T11				
958 a-d	Me	MeNHCS	T14				
959 a-d	Me	MeNHCS	T16				
960 a-d	Me	MeNHCS	T17				
961 a-d	Me	EtNHCS	T1				
962 a-d	Me	EtNHCS	T2				
963 a-d	Me	EtNHCS	T3				
964 a-d	Me	EtNHCS	T9				
965 a-d	Me	EtNHCS	T10				
966 a-d	Me	EtNHCS	T11				
967 a-d	Me	EtNHCS	T14				
968 a-d	Me	EtNHCS	T16				
969 a-d	Me	EtNHCS	T17				
970 a-d	Me	COSMe	T1				
971 a-d	Me	COSMe	T2				
972 a-d	Me	COSMe	T3				
973 a-d	Me	COSMe	T9				
974 a-d	Me	COSMe	T10				
975 a-d	Me	COSMe	T11				
976 a-d	Me	COSMe	T14				
977 a-d	Me	COSMe	T16				
978 a-d	Me	COSMe	T17				
979 a-d	Me	CSOMe	T1				
980 a-d	Me	CSOMe	T2				
981 a-d	Me	CSOMe	T3				
982 a-d	Me	CSOMe	T9				
983 a-d	Me	CSOMe	T10				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
984 a-d	Me	CSOMe	T11				
985 a-d	Me	CSOMe	T14				
986 a-d	Me	CSOMe	T16				
987 a-d	Me	CSOMe	T17				
988 a-d	Me	CSSMe	T1				
989 a-d	Me	CSSMe	T2				
990 a-d	Me	CSSMe	T3				
991 a-d	Me	CSSMe	T9				
992 a-d	Me	CSSMe	T10				
993 a-d	Me	CSSMe	T11				
994 a-d	Me	CSSMe	T14				
995 a-d	Me	CSSMe	T16				
996 a-d	Me	CSSMe	T17				
997 a-d	Me	COCOOMe	T1				
998 a-d	Me	COCOOMe	T2				
999 a-d	Me	COCOOMe	T3				
1000 a-d	Me	COCOOMe	T9				
1001 a-d	Me	COCOOMe	T10				
1002 a-d	Me	COCOOMe	T11				
1003 a-d	Me	COCOOMe	T14				
1004 a-d	Me	COCOOMe	T16				
1005 a-d	Me	COCOOMe	T17				
1006 a-d	Me	i-PrOCO	T1				
1007 a-d	Me	i-PrOCO	T2				
1008 a-d	Me	i-PrOCO	T3				
1009 a-d	Me	i-PrOCO	T9				
1010 a-d	Me	i-PrOCO	T10				
1011 a-d	Me	i-PrOCO	T11				

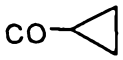
AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
1012 a-d	Me	i-PrOCO	T14				
1013 a-d	Me	i-PrOCO	T16				
1014 a-d	Me	i-PrOCO	T17				
1015 a-d	Et	CHO	T1				
1016 a-d	Et	CHO	T2				
1017 a-d	Et	CHO	T3				
1018 a-d	Et	CHO	T9				
1019 a-d	Et	CHO	T10				
1020 a-d	Et	CHO	T11				
1021 a-d	Et	CHO	T14				
1022 a-d	Et	CHO	T16				
1023 a-d	Et	CHO	T17				
1024 a-d	Et	COMe	T1				
1025 a-d	Et	COMe	T2				
1026 a-d	Et	COMe	T3				
1027 a-d	Et	COMe	T9				
1028 a-d	Et	COMe	T10				
1029 a-d	Et	COMe	T11				
1030 a-d	Et	COMe	T14				
1031 a-d	Et	COMe	T16				
1032 a-d	Et	COMe	T17				
1033 a-d	Et	COOMe	T1				
1034 a-d	Et	COOMe	T2				
1035 a-d	Et	COOMe	T3				
1036 a-d	Et	COOMe	T9				
1037 a-d	Et	COOMe	T10				
1038 a-d	Et	COOMe	T11				
1039 a-d	Et	COOMe	T14				

AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
1040 a-d	Et	COOMe	T16				
1041 a-d	Et	COOMe	T17				
1042 a-d	Et	COOEt	T1				
1043 a-d	Et	COOEt	T2				
1044 a-d	Et	COOEt	T3				
1045 a-d	Et	COOEt	T9				
1046 a-d	Et	COOEt	T10				
1047 a-d	Et	COOEt	T11				
1048 a-d	Et	COOEt	T14				
1049 a-d	Et	COOEt	T16				
1050 a-d	Et	COOEt	T17				
1051 a-d	Et	SO_2Me	T1				
1052 a-d	Et	SO_2Me	T2				
1053 a-d	Et	SO_2Me	T3				
1054 a-d	Et	SO_2Me	T9				
1055 a-d	Et	SO_2Me	T10				
1056 a-d	Et	SO_2Me	T11				
1057 a-d	Et	SO_2Me	T14				
1058 a-d	Et	SO_2Me	T16				
1059 a-d	Et	SO_2Me	T17				
1060 a-d	Et	SO_2Et	T1				
1061 a-d	Et	SO_2Et	T2				
1062 a-d	Et	SO_2Et	T3				
1063 a-d	Et	SO_2Et	T9				
1064 a-d	Et	SO_2Et	T10				
1065 a-d	Et	SO_2Et	T11				
1066 a-d	Et	SO_2Et	T14				
1067 a-d	Et	SO_2Et	T16				

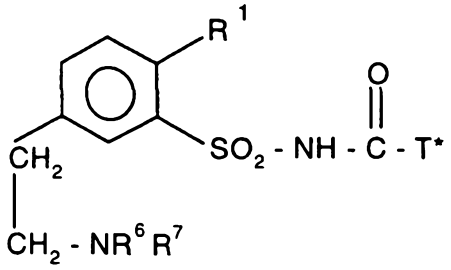
AUSTRALIAN PATENT OFFICE

Ex. No.	R^6	R^7	T*	(Ia)	(Ib)	(Ic)	(Id)
1068 a-d	Et	SO_2Et	T17				
1069a-d	H		T1	Na salt 187-190			
1070a-d	H	CO-Me	T1	Na salt 179-181			
1071a-d	Me	SO_2Et	T1	Na salt 125-135			
1072a-d	Me	SO_2CH_2F	T1	Na salt 170-175			

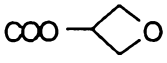
AUSTRALIAN PATENT OFFICE

Table 2

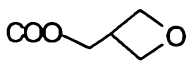
Compounds of the formula (Ie)



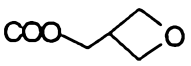
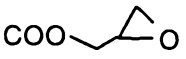
(Ie)

No.	R^1	R^6	R^7	T*	Physical data
1 e		H	CHO	T1	
2e	"	H	CHO	T11	
3e	"	Me	CHO	T1	
4e	"	Me	CHO	T11	
5e	"	H	$COCH_3$	T1	
6e	"	H	$COCH_3$	T11	
7e	"	Me	$COCH_3$	T1	
8e	"	Me	$COCH_3$	T11	
9e	"	H	$COCF_3$	T1	
10e	"	H	$COCF_3$	T11	
11e	"	Me	$COCF_3$	T1	
12e	"	Me	$COCF_3$	T11	
13e	"	H	COOMe	T1	
14e	"	H	COOMe	T11	
15e	"	Me	COOMe	T1	
16e	"	Me	COOMe	T11	

AUSTRALIAN PATENT OFFICE

No.	R^1	R^6	R^7	T*	Physical data
17e	"	H	COOEt	T1	
18e	"	H	COOEt	T11	
19e	"	Me	COOEt	T1	
20e	"	Me	COOEt	T11	
21e	"	H	SO_2Me	T1	
22e	"	H	"	T11	
23e	"	Me	"	T1	
24e	"	Me	"	T11	
25e	"	H	SO_2Et	T1	
26e	"	H	"	T11	
27e	"	Me	"	T1	
28e	"	Me	"	T11	
29e		H	CHO	T1	
30e	"	H	CHO	T11	
31e	"	Me	"	T1	
32e	"	Me	"	T11	
33e	"	H	$COCH_3$	T1	
34e	"	H	$COCH_3$	T11	
35e	"	Me	"	T1	
36e	"	Me	"	T11	
37e	"	H	$COCF_3$	T1	
38e	"	H	$COCF_3$	T11	
39e	"	Me	"	T1	
40e	"	Me	"	T11	
41e	"	H	COOMe	T1	
42e	"	H	COOMe	T11	

AUSTRALIAN PATENT OFFICE

No.	R^1	R^6	R^7	T*	Physical data
43e	"	Me	"	T1	
44e	"	Me	"	T11	
45e	"	H	COOEt	T1	
46e	"	H	COOEt	T11	
47e	"	Me	"	T1	
48e		Me	COOEt	T11	
49e	"	H	SO_2Me	T1	
50e	"	H	SO_2Me	T11	
51e	"	Me	"	T1	
52e	"	Me	"	T11	
53e	"	H	SO_2Et	T1	
54e	"	H	SO_2Et	T11	
55e	"	Me	"	T1	
56e	"	Me	"	T11	
57e		H	CHO	T1	
58e	"	H	CHO	T11	
59e	"	Me	CHO	T1	
60e	"	Me	"	T11	
61e	"	H	COMe	T1	
62e	"	H	COMe	T11	
63e	"	Me	COMe	T1	
64e	"	Me	COMe	T11	
65e	"	H	$COCF_3$	T1	

AUSTRALIAN PATENT OFFICE

No.	R^1	R^6	R^7	T*	Physical data
66e	"	H	$COCF_3$	T11	
67e	"	Me	"	T1	
68e	"	Me	"	T11	
69e	"	H	COOMe	T1	
70e	"	H	COOMe	T11	
71e	"	Me	"	T1	
72e	"	Me	"	T11	
73e	"	H	COOEt	T1	
74e	"	H	COOEt	T11	
75e	"	Me	"	T1	
76e	"	Me	"	T11	
77e	"	H	SO_2Me	T1	
78e	"	H	"	T11	
79e	"	Me	"	T1	
80e	"	Me	"	T11	
81e	"	H	SO_2Et	T1	
82e	"	H	"	T11	
83e	"	Me	"	T1	
84e	"	Me	"	T11	
85e	"	H	SO_2CF_3	T1	
86e	"	H	"	T11	
87e	"	Me	"	T1	
88e	"	Me	"	T11	
89e	SO_2n-Pr	H	CHO	T1	
90e	"	H	CHO	T11	
91e	"	H	COMe	T1	
92e	"	H	COMe	T11	
93e		H	COEt	T1	

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No.	R^1	R^6	R^7	T*	Physical data
94e	"	H	COEt	T11	
95e	"	H	$COCF_3$	T1	
96e	"	H	$COCF_3$	T11	
97e	"	H	COOMe	T1	
98e	"	H	COOMe	T11	
99e	"	H	COOEt	T1	
100e	"	H	COOEt	T11	
101e	"	H	SO_2Me	T1	
102e	"	H	SO_2Me	T11	
103e	"	H	SO_2Et	T1	
104e	"	H	SO_2Et	T11	
105e	"	Me	CHO	T1	
106e	"	Me	CHO	T11	
107e	"	Me	COMe	T1	
108e	"	Me	COMe	T11	
109e	"	Me	COEt	T1	
110e	"	Me	COEt	T11	
111e	"	Me	$COCF_3$	T1	
112e	"	Me	$COCF_3$	T11	
113e	"	Me	COOMe	T1	
114e	"	Me	COOMe	T11	
115e	"	Me	COOEt	T1	
116e	"	Me	COOEt	T11	
117e	"	Me	SO_2Me	T1	
118e	"	Me	SO_2Me	T11	
119e	"	Me	SO_2Et	T1	
120e	"	Me	SO_2Et	T11	
121e	"	Et	CHO	T1	

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No.	R^1	R^6	R^7	T*	Physical data
122e	"	Et	CHO	T11	
123e	"	Et	COMe	T1	
124e	"	Et	COMe	T11	
125e	"	Et	COEt	T1	
126e	"	Et	COEt	T11	
127e	"	Et	$COCF_3$	T1	
128e	"	Et	$COCF_3$	T11	
129e	"	Et	COOMe	T1	
130e	"	Et	COOMe	T11	
131e	"	Et	COOEt	T1	
132e	"	Et	COOEt	T11	
133e	"	Et	SO_2Me	T1	
134e	"	Et	SO_2Me	T11	
135e	"	Et	SO_2Et	T1	
136e	"	Et	SO_2Et	T11	
137e	SO_2NMe_2	H	CHO	T1	
138e	"	H	CHO	T11	
139e	"	H	COMe	T1	
140e	"	H	COMe	T11	
141e	"	H	COEt	T1	
142e	"	H	$COCF_3$	T1	
143e	"	H	$COCF_3$	T11	
144e	"	H	COOMe	T1	
145e	"	H	COOMe	T11	
146e	"	H	COOEt	T1	
147e	"	H	COOEt	T11	
148e	"	H	SO_2Me	T1	
149e	"	H	SO_2Me	T11	

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No.	R^1	R^6	R^7	T*	Physical data
150e	"	H	SO_2Et	T1	
151e	"	H	SO_2Et	T11	
152e	"	Me	CHO	T1	
153e	"	Me	CHO	T11	
154e	"	Me	COMe	T1	
155e	"	Me	COMe	T11	
156e	"	Me	COEt	T1	
157e	"	Me	COEt	T11	
158e	"	Me	$COCF_3$	T1	
159e	"	Me	$COCF_3$	T11	
160e	"	Me	COOMe	T1	
161e	"	Me	COOMe	T11	
162e	"	Me	COOEt	T1	
163e	"	Me	COOEt	T11	
164e	"	Me	SO_2Me	T1	
165e	"	Me	SO_2Me	T11	
166e	"	Me	SO_2Et	T1	
167e	"	Me	SO_2Et	T11	
168e	"	Et	CHO	T1	
169e	"	Et	CHO	T11	
170e	"	Et	COMe	T1	
171e	"	Et	COMe	T11	
172e	"	Et	COEt	T1	
173e	"	Et	COEt	T11	
174e	"	Et	$COCF_3$	T1	
175e	"	Et	$COCF_3$	T11	
176e	"	Et	COOMe	T1	
177e	"	Et	COOMe	T11	

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No.	R^1	R^6	R^7	T*	Physical data
178e	"	Et	COOEt	T1	
179e	"	Et	COOEt	T11	
180e	"	Et	SO_2Me	T1	
181e	"	Et	SO_2Me	T11	
182e	"	Et	SO_2Et	T1	
183e	"	Et	SO_2Et	T11	
184e	SCH_3	H	CHO	T1	
185e	"	H	CHO	T11	
186e	"	H	COOMe	T1	
187e	"	H	COOMe	T11	
188e	"	H	SO_2Me	T1	
189e	"	H	"	T11	
190e	"	Me	CHO	T1	
191e	"	Me	CHO	T11	
192e	"	Me	COOMe	T1	
193e	"	Me	COOMe	T11	
194e	"	Me	SO_2Me	T1	
195e	"	Me	SO_2Me	T11	
196e	SC_2H_5	H	CHO	T1	
197e	"	H	CHO	T11	
198e	"	H	COOMe	T1	
199e	"	H	COOMe	T11	
200e	"	H	SO_2Me	T1	
201e	"	H	"	T11	
202e	"	Me	CHO	T1	
203e	"	Me	CHO	T11	
204e	"	Me	COOMe	T1	
205e	"	Me	COOMe	T11	

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No.	R^1	R^6	R^7	T*	Physical data
206e	"	Me	SO_2Me	T1	
207e	"	Me	SO_2Me	T11	
208e	$SO\text{-}CH_3$	H	CHO	T1	
209e	"	H	CHO	T11	
210e	"	H	COOMe	T1	
211e	"	H	COOMe	T11	
212e	"	H	SO_2Me	T1	
213e	"	H	"	T11	
214e	"	Me	CHO	T1	
215e	"	Me	CHO	T11	
216e	"	Me	COOMe	T1	
217e	"	Me	COOMe	T11	
218e	"	Me	SO_2Me	T1	
219e	"	Me	SO_2Me	T11	
220e	$SO\text{-}C_2H_5$	H	CHO	T1	
221e	"	H	CHO	T11	
222e	"	H	COOMe	T1	
223e	"	H	COOMe	T11	
224e	"	H	SO_2Me	T1	
225e	"	H	"	T11	
226e	"	Me	CHO	T1	
227e	"	Me	CHO	T11	
228e	"	Me	COOMe	T1	
229e	"	Me	COOMe	T11	
230e	"	Me	SO_2Me	T1	
231e	"	Me	SO_2Me	T11	
232e	"	Et	CHO	T1	
233e	"	Et	CHO	T11	

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No.	R^1	R^6	R^7	T*	Physical data
234e	"	Et	$COOCH_3$	T1	
235e	"	Et	$COOCH_3$	T11	
236e	"	Et	SO_2Me	T1	
237e	"	Et	SO_2Me	T11	
238e	$CO\text{-}NMe_2$	H	CHO	T11	
239e	"	H	COMe	T1	
240e	"	H	COMe	T11	
241e		H	COEt	T1	
242e	"	H	COEt	T11	
243e	"	H	$COCF_3$	T1	
244e	"	H	$COCF_3$	T11	
245e	"	H	COOMe	T1	
246e	"	H	COOMe	T11	
247e	"	H	COOEt	T1	
248e	"	H	COOEt	T11	
249e	"	H	SO_2Me	T1	
250e	"	H	SO_2Me	T11	
251e	"	H	SO_2Et	T1	
252e	"	H	SO_2Et	T11	
253e	"	Me	CHO	T1	
254e	"	Me	CHO	T11	
255e	"	Me	COMe	T1	
256e	"	Me	COMe	T11	
257e	"	Me	COEt	T1	
258e	"	Me	COEt	T11	
260e	"	Me	$COCF_3$	T1	
261e	"	Me	$COCF_3$	T11	
262e	"	Me	COOMe	T1	

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No.	R^1	R^6	R^7	T*	Physical data
263e	"	Me	COOMe	T11	
264e	"	Me	COOEt	T1	
265e	"	Me	COOEt	T11	
266e	"	Me	SO_2Me	T1	
267e	"	Me	SO_2Me	T11	
268e	"	Me	SO_2Et	T1	
269e	"	Me	SO_2Et	T11	
270e	"	Et	CHO	T1	
271e	"	Et	CHO	T11	
272e	"	Et	COMe	T1	
273e	"	Et	COMe	T11	
274e	"	Et	COEt	T1	
275e	"	Et	COEt	T11	
276e	"	Et	$COCF_3$	T1	
278e	"	Et	$COCF_3$	T11	
279e	"	Et	COOMe	T1	
280e	"	Et	COOMe	T11	
281e	"	Et	COOEt	T1	
282e	"	Et	COOEt	T11	
283e	"	Et	SO_2Me	T1	
284e	"	Et	SO_2Me	T11	
285e	"	Et	SO_2Et	T1	
286e	"	Et	SO_2Et	T11	
287e	"	H	CHO	T1	

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B. Formulation examples

a) A dust is obtained by mixing 10 parts by weight of a compound of the formula (I) and 90 parts by weight of talc as inert substance and comminuting the mixture in a hammer mill.

b) A wettable powder which is readily dispersible in water is obtained by mixing 25 parts by weight of a compound of the fomula (I), 64 parts by weight of kaolin-containing quartz as inert substance, 10 parts by weight of potassium lignosulfonate and 1 part by weight of sodium oleoylmethyltaurinate as wetter and dispersant and grinding the mixture in a pinned-disk mill.

c) A dispersion concentrate which is readily dispersible in water is obtained by mixing 20 parts by weight of a compound of the formula (I) with 6 parts by weight of alkylphenyl polyglycol ether (®Triton X 207), 3 parts by weight of isotridecanol polyglycol ether(8 EO) and 71 parts by weight of paraffinic mineral oil (boiling range for example approx. 255 to above 277°C) and grinding the mixture in a ball mill to a fineness of below 5 microns.

d) An emulsifiable concentrate is obtained from 15 parts by weight of a compound of the formula (I), 75 parts by weight of cyclohexanone as the solvent and 10 parts by weight of ethoxylated nonylphenol as the emulsifier.

e) Water-dispersible granules are obtained by mixing

75 parts by weight of a		compound of the formula (I),
10	"	of calcium lignosulfonate,
5	"	of sodium lauryl sulfate,
3	"	of polyvinyl alcohol and
7	"	of kaolin,

grinding the mixture on a pinned-disk mill and granulating the powder in a fluidized bed by spraying on water as the granulation liquid.

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f) Water-dispersible granules are also obtained by homogenizing and precomminuting, on a colloid mill,

25 part(s) by weight		of a compound of the formula (I),
5	"	of sodium 2,2'-dinaphthylmethane-6,6'-disulfonate
2	"	of sodium oleoylmethyltaurinate,
1	"	of polyvinyl alcohol,
17	"	of calcium carbonate and
50	"	of water,

subsequently grinding the mixture in a bead mill and atomizing and drying the resulting suspension in a spray tower by means of a single-substance nozzle.

C. Biological Examples

1. Pre-emergence effect on weeds

Seeds or rhizome pieces of monocotyledonous and dicotyledonous weed plants were placed in sandy loam soil in plastic pots and covered with soil. The compounds of the formula (I) according to the invention or salts thereof which were formulated in the form of wettable powders or emulsion concentrates were then applied to the surface of the soil cover in the form of aqueous suspensions or emulsions at an application rate of 600 to 800 l of water/ha (converted), in various dosages.

After the treatment, the pots were placed in a greenhouse and kept under good growth conditions for the weeds. After the test plants had emerged, the damage to the plants or the negative effects on the emergence was scored visually after a test period of 3 to 4 weeks by comparison with untreated controls. As shown by the test results, the compounds according to the invention have a good herbicidal pre-emergence activity against a broad spectrum of grass weeds and dicotyledonous weeds. For example, the compounds of Examples No. 1a, 18a, 69a, 86a, 103a,137a,154a, 259a, 529a, 530a, 531a, 532a, 549a, 566a, 634a, 668a, 685a,

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835a, 1069a, 1070a, 1071a and 1072a, (see Section A, Table 1) have a very good herbicidal activity against harmful plants such as Sinapis alba, Stellaria media, Chrysanthemum segetum and Lolium multiflorum pre-emergence at an application rate of 0.3 kg to 0.005 kg of active substance per hectare.

2. Post-emergence effect on weeds

Seeds or rhizome pieces of monocotyledonous and dicotyledonous weeds were placed in sandy loam soil in plastic pots, covered with soil and grown in a greenhouse under good growth conditions. Three weeks after sowing, the test plants were treated at the three-leaf stage. The compounds of the formula (I) according to the invention or salts thereof which were formulated as wettable powders or emulsion concentrates were sprayed, at various dosages, onto the green parts of the plants at an application rate of 600 to 800 l of water/ha (converted). After the test plants had remained in the greenhouse for about 3 to 4 weeks under ideal growth conditions, the effect of the preparations was scored visually by comparison with untreated controls. The agents according to the invention also have a good herbicidal activity post-emergence against a broad spectrum of economically important grass weeds and dicotyledonous weeds. For example, the compounds of Examples No. 1a, 18a, 69a, 86a, 103a,137a,154a, 259a, 529a, 530a, 531a, 532a, 549a, 566a, 634a, 668a, 685a, 835a, 1069a, 1070a, 1071a and 1072a, (see Section A, Table 1) have a very good herbicidal activity against harmful plants such as Sinapis alba, Stellaria media, Chrysanthemum segetum and Lolium multiflorum post-emergence at an application rate of 0.3 kg to 0.005 kg of active substance per hectare.

3. Tolerance by crop plants

In further greenhouse experiments, seeds of a substantial number of crop plants and weeds were placed in sandy loam soil and covered with soil.

Some of the pots were treated immediately as described under 1., and the

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remaining pots were placed in a greenhouse until the plants had developed two to three true leaves and then sprayed with various dosages of the substances of the formula (I) according to the invention or salts thereof, as described under 2.

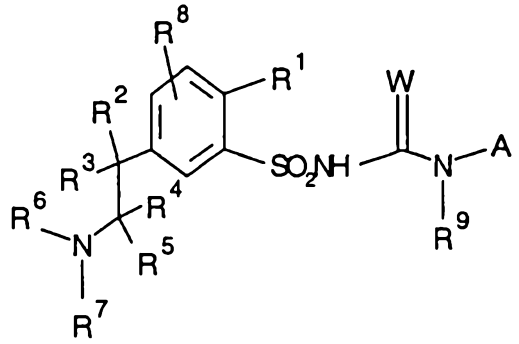
Visual scoring four to five weeks after the application and after the plants had been in the greenhouse revealed that the compounds according to the invention did not inflict any damage to dicotyledonous crops such as, for example, soya, cotton, oil seed rape, sugar beet and potatos when used pre- and post-emergence, even when high dosages of active ingredient were used. Moreover, some substances also left Gramineae crops such as, for example, barley, wheat, rye, sorghum species, maize or rice unharmed. The compounds of the formula (I) or salts thereof thus have a high selectivity when used for controlling undesired plant growth in agricultural crops.

"Comprises/comprising" when used in this specification is taken to specify the presence of stated features, integers, steps or components but does not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.

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We claim:

1. A compound of the formula (I) or a salt thereof



(I)

in which

R^1 is an acyl radical of the formula $S(O)_n$-R^{10} or CO-Q-R^{11},

R^2, R^3, R^4, R^5 are identical or different radicals selected from the group consisting of H, (1-6)alkyl, (1-4)alkoxy, (1-4)haloalkyl, (1-4)haloalkoxy and halogen,

R^6 is H, OH, formyl, a radical of the formula R, R-O-, R-CO, R-O-CO-, R-SO_2-, R-SO- or RR°NSO_2-, in which each of the radicals R and R° is a hydrocarbon radical which is unsubstituted or substituted and,

R^7 is an acyl radical or

NR^6R^7 together are a heterocyclic radical which has 3 to 8 ring atoms and which, besides the nitrogen atom of the group NR^6R^7 as hetero ring atom, optionally has 1 to 3 further hetero ring atoms selected from the group consisting of N, O and S and which is unsubstituted or is substituted and which has at least one electron-attracting group in neighboring position to the nitrogen atom of the group NR^6R^7,

W is an oxygen or sulfur atom,

R^8 is H, (1-6)alkyl, (2-6)alkenyl, (1-6)alkoxy, (1-4)alkylthio, [(1-4)alkyl]carbonyl or [(1-4)alkoxy]carbonyl, each of the six last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio and CN, or is halogen, NO_2, CN, NH_2 or mono- or disubstituted amino,

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R^9 is H or (1-6)alkyl,

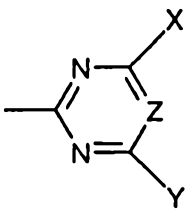
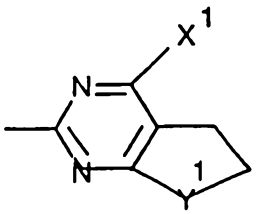
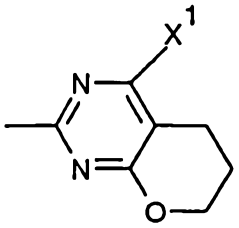
R^{10} is NH_2, mono- or disubstituted amino or a hydrocarbon radical which is unsubstituted or substituted and which,

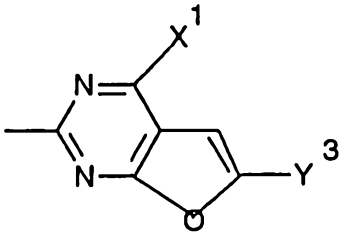
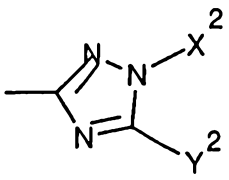
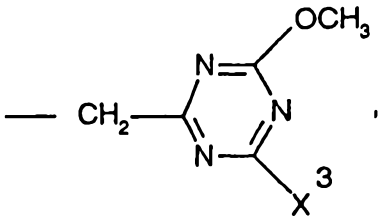
n is the number 0, 1 or 2, with the exception of the case $R^{10} = NH_2$ or mono- or disubstituted amino, in which case n = 2,

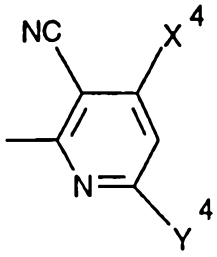
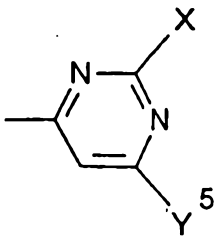
R^{11} is H or a hydrocarbon radical which is unsubstituted or substituted, or is a heterocycle which has 3 to 8 ring atoms and which is unsubstituted or substituted and,

Q is an oxygen or sulfur atom or a group of the formula -NR'- in which R' is H or a hydrocarbon radical which is unsubstituted or substituted, or is an acyl radical,

A is a radical of the formula


,

,

,


,

,

,


or


one of the radicals X and Y is hydrogen, halogen, (1-3)alkyl or (1-3)alkoxy, each of

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the two last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-3)alkoxy and (1-3)alkylthio, and

the other of the radicals X and Y is hydrogen, halogen, (1-3)alkyl, (1-3)alkoxy or (1-3)alkylthio, each of the three last-mentioned alkyl-containing radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-3)alkoxy and (1-3)alkylthio, or is a radical of the formula NR^aR^b, (3-6)cycloalkyl, (2-4)alkenyl, (2-4)alkynyl, (3-4)alkenyloxy or (3-4)alkynyloxy,

Z is CH or N,

R^a and R^b independently of one another are H, (1-4)alkyl or (2-4)alkenyl,

X^1 is CH_3, OCH_3, OC_2H_5 or $OCHF_2$,

Y^1 is -O- or $-CH_2-$,

X^2 is CH_3, C_2H_5 or CH_2CF_3,

Y^2 is OCH_3, OC_2H_5, SCH_3, SCH_2CH_3, CH_3 or C_2H_5,

X^3 is CH_3 or OCH_3,

Y^3 is H or CH_3,

X^4 is CH_3, OCH_3, OC_2H_5, CH_2OCH_3 or Cl,

Y^4 is CH_3, OCH_3, OC_2H_5 or Cl and

Y^5 is CH_3, C_2H_5, OCH_3 or Cl.

2. A compound or salt thereof as claimed in claim 1, wherein

R^1 is $S(O)_n$-R^{10} or $COQR^{11}$,

R^2, R^3, R^4, R^5 independently of one another are H or (1-4)alkyl,

R^6 is H, OH, formyl, (1-6)alkyl, (2-6)alkenyl, (2-4)alkynyl, (1-6)alkoxy, (2-6)alkenyloxy, (2-6)alkynyloxy, [(1-6)alkyl]carbonyl, [(2-6)alkenyl]-carbonyl, [(2-6)alkynyl]carbonyl), (1-4)alkylsulfonyl, (2-6)alkenylsulfonyl, (2-6)alkynylsulfonyl, (3-6)cycloalkyl, (5-6)cycloalkenyl, [(3-6)cycloalkyl]-carbonyl, [(5-6)cycloalkenyl]carbonyl, [(3-6)cycloalkyl]sulfonyl, [(5-6)cycloalkenyl]sulfonyl, each of the 18 last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio, (1-4)alkylsulfinyl, (1-

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4)alkylsulfonyl, [(1-4)alkoxy]carbonyl, [(1-4)alkyl]carbonyl, [(1-4)alkyl]carbonyloxy and CN and, in the case of cyclic radicals, also by (1-4)alkyl and (1-4)haloalkyl,

or

phenylcarbonyl or phenylsulfonyl, each of the two last-mentioned radicals being unsubstituted or substituted in the phenyl ring by one or more radicals selected from the group consisting of halogen, CN, NO_2, (1-4)alkyl, (1-4)haloalkyl, (1-4)alkoxy and (1-4)haloalkoxy,

R^7 is CHO, [(1-6)alkyl]carbonyl, [(2-6)alkenyl]carbonyl, [(2-6)alkynyl]-carbonyl, (1-6)alkylsulfonyl, (2-6)alkenylsulfonyl, (2-6)alkynylsulfonyl, [(3-6)cycloalkyl]carbonyl, [(5-6)cycloalkenyl]carbonyl, [(3-6)cycloalkyl]sulfonyl, (5-6)cycloalkenylsulfonyl, each of the 10 last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio, (1-4)alkylsulfonyl, (1-4)alkylsulfinyl, (1-4)alkylcarbonyl, [(1-4)alkoxy]-carbonyl, [(1-4)alkyl]carbonyloxy and CN and, in the case of cyclic radicals, also by (1-4)alkyl and (1-4)haloalkyl,

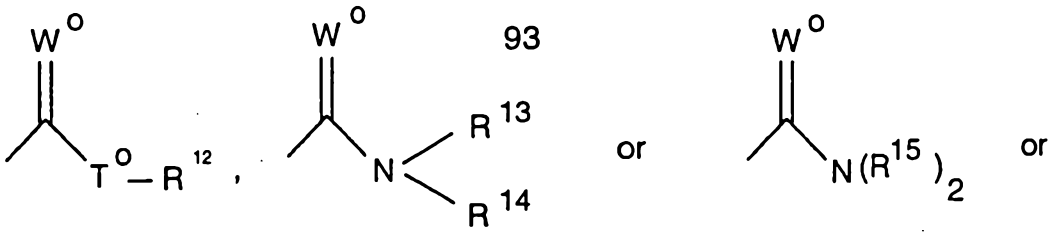
or

phenylcarbonyl or phenylsulfonyl, each of the two last-mentioned radicals being unsubstituted or substituted in the phenyl ring by one or more radicals selected from the group consisting of halogen, CN, NO_2, (1-4)alkyl, (1-4)haloalkyl, (1-4)alkoxy and (1-4)haloalkoxy,

or

mono- or di[(1-4)alkyl]aminosulfonyl which is unsubstituted or substituted in the alkyl moiety by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio, (1-4)alkylsulfinyl, (1-4)alkylsulfonyl, [(1-4)alkyl]carbonyl, [(1-4)alkyl]carbonyloxy, [(1-4)alkoxy]carbonyl and CN, or a group of the formula COCOR' in which R' = H, OH, (1-4)alkoxy or (1-4)alkyl, or a group of the formula

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R^6 and R^7 together are a chain of the formula $(-CH_2)_{m1}B^1-$ or $-B^1-(CH_2)_{m2}B^2-$, the chain being unsubstituted or substituted by one or more (1-3)alkyl radicals or halogen and m1 is 3, 4 or 5 and m2 is 2, 3 or 4, and

W, W^o are an oxygen atom or a sulfur atom,

B^1,B^2 independently of one another are SO_2 or CO,

Q is O, S or NR^{16},

T^o is O or S,

R^8 is H, (1-4)alkyl, (1-4)alkoxy, (1-4)alkylthio, [(1-4)alkyl]carbonyl or [(1-4)alkoxy]carbonyl, each of the last-mentioned 5 radicals being unsubstituted or substituted in the alkyl moiety by one or more halogen atoms, or is halogen, NO_2, CN or mono- or di(1-4)alkylamino,

R^9 is H or CH_3,

R^{10} is $NR^{17}R^{18}$, (1-6)alkyl, (2-6)alkenyl, (2-6)alkynyl, (3-6)cycloalkyl, (5-6)cycloalkenyl or phenyl, each of the last-mentioned 6 radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, CN, (1-4)alkoxy, (1-4)alkylthio, (1-4)alkylsulfinyl, (1-4)alkylsulfonyl, [(1-4)alkyl]carbonyl, [(1-4)alkoxy]carbonyl and [(1-4)alkyl]carbonyloxy,

n is the number 0, 1 or 2, unless $R^{10} = NR^{17}R^{18}$, in which case n = 2, and

R^{11} is H, (1-6)alkyl, (2-6)alkenyl, (2-6)alkynyl, (3-6)cycloalkyl, (5-6)cycloalkenyl or phenyl, each of the last-mentioned 6 radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, CN, (1-4)alkoxy, (1-4)alkylthio, (1-4)alkylsulfinyl, (1-4)alkylsulfonyl, [(1-4)alkyl]carbonyl, [(1-4)alkoxy]carbonyl and [(1-4)alkyl]carbonyloxy, and, in the case of cyclic radicals, also by (1-4)alkyl and (1-4)haloalkyl, or is a radical of the heterocyclyl or heterocyclyl(1-4)alkyl type which has 3-7 ring atoms and 1 to 3 hetero ring atoms selected from the group consisting of N, O and S,

R^{12} is (1-4)alkyl, (3-4)alkenyl or (3-4)alkynyl, each of the three last-mentioned

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radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio, [(1-4)alkyl]carbonyl and [(1-4)alkoxy]carbonyl,

R^{13}, R^{14} independently of one another are H, (1-4)alkyl, (3-4)alkenyl oder (3-4)alkynyl, each of the three last-mentioned radicals being unsubstituted or substituted by one or more of the radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio, [(1-4)alkyl]carbonyl and [(1-4)alkoxy]carbonyl,

the radicals R^{15} together with the nitrogen atom are a heterocyclic ring which has 5 or 6 ring members, may contain further hetero atoms selected from the group consisting of N, O and S at the oxidation levels which are possible and which is unsubstituted or substituted by (1-4)alkyl or the oxo group, or which is benzo-fused,

R^{16} is H, (1-4)alkyl, (3-4)alkenyl or (3-4)alkynyl, each of the three last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy and (1-4)alkylthio,

R^{17} is H, (1-4)alkyl or (1-4)alkoxy, and

R^{18} is H or (1-4)alkyl.

3. A compound or salt thereof as claimed in claim 1 or 2, wherein

R^1 is $S(O)_n$-R^{10} or CO-OR^{11},

n is the number 0, 1 or 2, with the exception of the case $R^{10} = NR^{17}R^{18}$, in which case n = 2,

R^6 is H or (1-4)alkyl which is unsubstituted or substituted by one or more halogen atoms or by one or more radicals selected from the group (1-4)alkoxy and (1-4)alkylthio,

R^7 is formyl, [(1-6)alkyl]carbonyl, [(2-4)alkenyl]carbonyl, [(2-4)alkynyl]carbonyl, [(3-6)cycloalkyl]carbonyl or (1-6)alkylsulfonyl, each of the 5 last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (1-4)alkoxy, (1-4)alkylthio, (1-4)alkylsulfonyl, [(1-4)alkyl]carbonyl, [(1-4)alkoxy]carbonyl, [(1-

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4)alkyl]carbonyloxy and CN and, in the case of cyclic radicals, also (1-4)alkyl and (1-4)haloalkyl, or

phenylcarbonyl or phenylsulfonyl, each of the two last-mentioned radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, CN, SO_2, (1-4)alkyl, (1-4)haloalkyl, (1-4)alkoxy and (1-4)haloalkoxy, or

mono- or di[(1-4)-alkyl]aminosulfonyl, or a group of the formula -CO-CO-R' in which R' is (1-4)alkoxy, or

a group of the formula $-CW^o-R^{12}$, $-CW^o-NR^{13}R^{14}$ or $-CW^o-N(R^{15})_2$ or

R^6, R^7 together are a chain of the formula $(-CH_2)_{m1}B^1-$ or $-B^1-(CH_2)_{m2}B^2-$, m1 being 3, 4 or 5 and m2 being 2, 3 or 4, and

W, W^o in each case independently are an oxygen or sulfur atom,

T^o is an oxygen or sulfur atom,

B^1 is SO_2 or CO,

B^2 is SO_2 or CO,

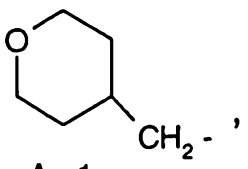
Q is O, S or NR^{16},

R^8 is a hydrogen atom,

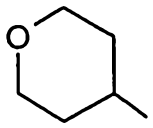
R^9 is H or CH_3,

R^{10} is $NR^{17}R^{18}$, (1-6)alkyl or (3-6)cycloalkyl,

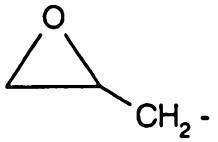
R^{11} is H, (1-6)alkyl, (3-6)cycloalkyl or a radical of the formulae A-1 to A-6,



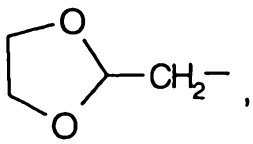
A - 1 ,



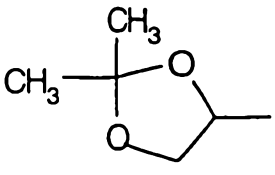
A - 2 ,



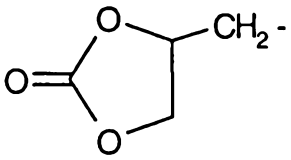
A - 3



A - 4 ,



A - 5



A - 6

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R^{12} is (1-4)alkyl or (1-4)haloalkyl,

R^{13}, R^{14} independently of one another are H or (1-4)alkyl,

the radicals R^{15} together are a divalent chain of the formula $-(CH_2)_{m3}-$ in which m3 is 3, 4 or 5, or of the formula $-CH_2CH_2-O-CH_2CH_2-$,

R^{16} is H or (1-4)alkyl,

R^{17} is H or (1-4)alkyl and

R^{18} is H or (1-4)alkyl.

4. A compound or salt thereof as claimed in any of claims 1 to 3, wherein

R^6 is H or (1-4)alkyl,

R^7 is CHO, [(1-6)alkyl]carbonyl, [(1-4)haloalkyl]carbonyl, [(1-4)álkoxy-(1-4)alkyl]carbonyl, [(3-6)cycloalkyl]carbonyl, phenylcarbonyl which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, CN, NO_2, (1-4)alkyl, (1-4)haloalkyl, (1-4)alkoxy and (1-4)haloalkoxy, or is phenylsulfonyl which is unsubstituted or substituted by one or more radicals selected from the group consisting of (1-4)alkyl and (1-4)alkoxy, or is mono- or di[(1-4)alkyl]aminosulfonyl, (1-6)alkylsulfonyl, (1-4)haloalkylsulfonyl or a group of the formula

$-CW^o-T^o-R^{12}$ or $-CW^o-NR^{13}R^{14}$

W, W^o independently of one another are in each case O or S,

T^o is O or S,

Q is O, S or NR^{16},

R^{10} is $NR^{17}R^{18}$, (1-4)alkyl or (3-6)cycloalkyl,

R^{11} is H or (1-4)alkyl,

R^{12} is (1-4)alkyl,

R^{13}, R^{14} independently of one another are H or (1-4)alkyl,

R^{16} is H or (1-3)alkyl,

R^{17} is (1-4)alkyl and

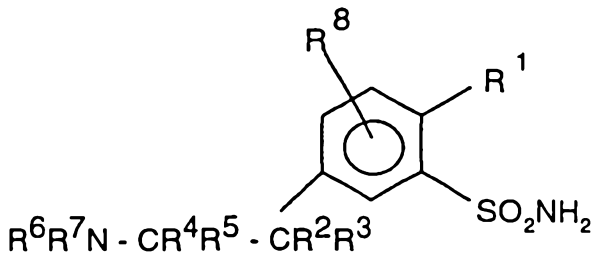
R^{18} is H or (1-4)alkyl.

5. A process for the preparation of a compound of the formula (I) or a salt

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thereof as defined in any of claims 1 to 4, which comprises

a) reacting a compound of the formula (II)



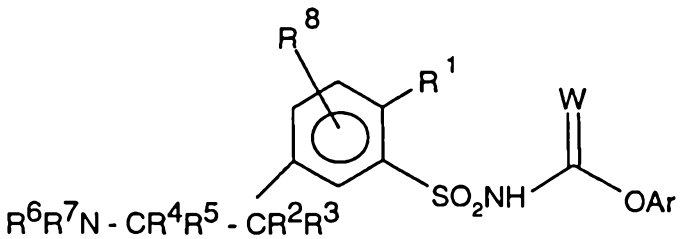
(II)

with a heterocyclic carbamate of the formula (III)

$$R^* - O - CO - NR^9 - A \qquad \text{(III)}$$

in which R* is optionally substituted phenyl or (C_1-C_4)alkyl, or

b) reacting an arylsulfonylcarbamate of the formula (IV)



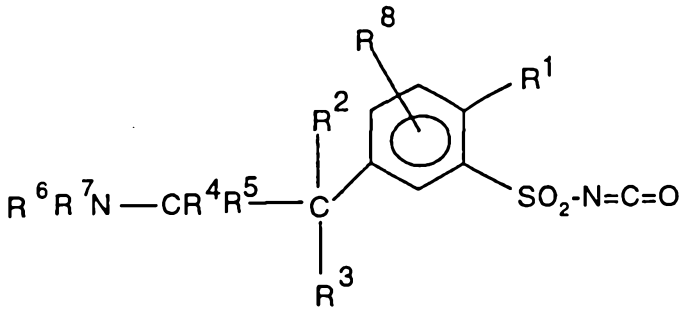
(IV),

in which Ar is an aryl radical, with an amino heterocycle of the formula (V)

$$H - NR^9 - A \qquad \text{(V), or}$$

c) reacting a sulfonyl isocyanate of the formula (VI)

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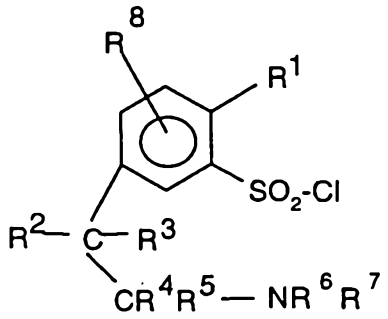


(VI)

with an amino heterocycle of the formula H-NR^9-A (V), or

d) first reacting, in a one-pot reaction, an amino heterocycle of the formula H-NR^9-A (V) with phosgene in the presence of a base and reacting the intermediate formed with a phenylsulfonamide of the formula (II), or

e) reacting a sulfonyl chloride of the formula (VII)



(VII)

with a cyanate M-OCN in which M = a cation and with an amino heterocycle of the formula H-NR^9-A (V) in the presence of a base, or

f) reacting a sulfonamide of the abovementioned formula (II) with a (thio)isocyanate of the formula (V')

$$W = C = N - A \qquad (V')$$

in the presence of a base,

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where, in formulae (II)-(VII) and (V'), the radicals or symbols R^1-R^9, A, W and n are as defined in formula (I) as claimed in claim 1 and where, in variants a) and c)-e), the initial products are compounds of the formula (I) where W = O.

6. A herbicidal or plant-growth-regulating composition which comprises one or more compounds of the formula (I) or salts thereof as claimed in any of claims 1 to 4 and formulation auxiliaries conventionally used in crop protection.

7. A method of controlling harmful plants or for regulating the growth of plants, which comprises applying an effective amount of one or more compounds of the formula (I) or salts thereof as claimed in any of claims 1 to 4 to the plants, seeds of the plants or the area under cultivation.

8. The use of a compound of the formula (I) or a salt thereof as claimed in any of claims 1 to 4 as a herbicide and plant growth regulator.

9. Compounds of the formulae (II), (IV), (VI) or (VII), as they are defined in claim 5.

DATED this 21st day of November, 2000.

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