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Strobel et al.

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[54] **TRIAZOLE BRIGHTENERS**

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[52] **U.S. Cl.** ..... **260/240 C,** 106/22, 106/176, 117/33.5 T, 252/117, 252/301.2 W, 252/543, 260/37 NP, 260/41 C, 260/75 N, 260/78 R, 260/93.7, 260/193, 260/482 R, 260/561 A, 424/251

[51] **Int. Cl.** **C07d 51/42**

[58] **Field of Search** ..... 260/240 C, 240 CA

[56] **References Cited**

UNITED STATES PATENTS

2,543,333	2/1951	Parker et al.	260/240 CA
3,222,371	12/1965	Buell et al.	260/294.8 X
3,453,268	7/1969	Dorlars et al.	260/240 C
3,459,744	8/1969	Dorlars et al.	260/240 C

OTHER PUBLICATIONS

Richter et al., J. Am. Chem. Soc., Vol. 78, pp. 5848–5852, (1956).

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[57] **ABSTRACT**

The instant invention relates to 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol compounds, which compounds are fluorescent pigments and, further, which compounds have brightening agent properties, and to 5-amino-2-(4-styrylphenyl)-2H-1,2,3-triazole-4-carboxamides which compounds also have brightening properties and, further, which compounds are useful in the preparation of the above-stated 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol.

7 Claims, No Drawings

TRIAZOLE BRIGHTENERS

The instant invention is directed to novel triazole brightening agents and fluorescent pigments. In particular, the instant invention is directed to 2-(4-styryl-phenyl)-2H-v-triazole [4,5-d]pyrimidin-7-ol and 5-amino-2-(4-styrylphenyl)-2H-1,2,3-triazole-4-carboxamides which compounds are useful as fluorescent pigments and/or brightening agents and, further, which latter compound is useful in the preparation of the former class of compounds.

It is well known in the art that textiles, plastics in film or solid form, and other materials have a tendency to develop a yellowish shade which cannot be removed therefrom by ordinary techniques of washing, bleaching and the like. As a result thereof considerable effort has been directed to developing techniques which were successful in removing said yellowish shade including "bluing" white materials with blue pigments or fugitive blue dyestuffs. Such techniques have, however, become obsolete and have in general been superseded by those techniques which employ fluorescent optical bleaching agents and/or brighteners. Such later techniques, i.e., those employing said fluorescent optical bleaching agents and/or brighteners can be performed either by utilizing said fluorescent optical bleaching agents or brighteners either as additives to soap or detergent or used in the dye bath and/or in so-called melt incorporation techniques wherein said materials are incorporated into the plastic mass prior to shaping. Said fluorescent optical bleaching agents perform the desired function by virtue of their characteristic absorption of ultraviolet radiation and the subsequent conversion of the energy to light energy within the visible spectrum. This converted and emitted energy within the visible spectrum tends to neutralize any yellowness of the material and thereby increases the apparent whiteness thereof.

Numerous chemical compounds have been suggested and employed as fluorescent brightening agents. One such class of compounds has been the 2-(4-styrylphenyl)-2H-1,2,3-benzo and naphtho triazoles as is exemplified in U.S. Pat. Nos. 2,713,054; 2,713,057; 2,784,183; 2,784,184; and numerous others.

The object of the instant invention is to provide a new class of compounds which are either fluorescent pigments and/or brightening agents.

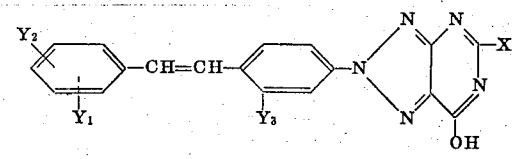
A further object of the instant invention is to provide 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol compounds, which compounds are fluorescent pigments and, in addition, have brightening agent characteristics.

A still further object of the instant invention is to provide 5-amino-2-(4-styrylphenyl)-2H-1,2,3-triazole-4-carboxamides which compounds have brightening characteristics.

A still further object of the instant invention is to provide 5-amino-2-(4-styrylphenyl)-2H-1,2,3-triazole-4-carboxamide compounds which compounds are useful in the preparation of 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol compounds.

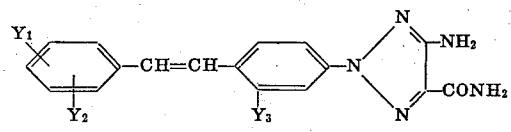
These and other objects of the instant invention will become more evident from the following more detailed description thereof.

As previously noted, the instant invention is directed to 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol compounds which have the general formula:



wherein X represents hydrogen or a lower alkyl group such as methyl, ethyl, propyl and butyl; Y_1, Y_2 and Y_3 represent hydrogen, lower alkyl such as methyl and ethyl, lower alkoxy, such as methoxy, ethoxy, propoxy, isopropoxy, butoxy, sec. butoxy, cyano, chloro and the like. Additionally, Y_3 may be COOMe and SO_3Me, and Y_1 and Y_2 may be SO_3Me, wherein Me is hydrogen, ammonium, sodium or potassium.

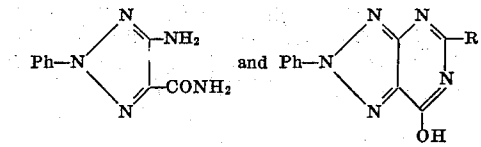
In addition, the instant invention is directed to those 5-amino-2-(4-styrylphenyl)-2H-1,2,3-triazole-4-carboxamide compounds which have the formula:



wherein Y_1, Y_2 and Y_3 have the same designation as noted above.

It is to be noted that all of the above compounds which have anionic substituents thereon, and, in particular, sulfonic or carboxylic acid substituents, are water soluble whereas those which do not contain such groups are not water soluble.

In general, compounds related to those of the instant invention are well known in the art. For example, in the Journal of the American Chemical Society, 78, 5848 (1956) compounds are disclosed which have the formula:



wherein R is hydrogen and methyl.

In this article Ph is disclosed to be only a phenyl substituent. Such compounds, due as a result of their inherent structure, have fluorescent properties. It has unexpectedly been found, however, that the substitution of a stilbyl radical for the phenyl radical in said compounds results in an enhancement of said fluorescent properties yielding dyeings which have excellent brightening and fluorescent properties especially when applied to fabrics. It is also noted that those products which have water solubilizing groups such as sulfonic and carboxylic acids are useful as optical brightening agents for materials such as fabrics comprised of natural or synthetic fibers, i.e., those fabrics containing materials such as, for example, cotton and/or nylon, paper, and similar materials. It is also noted that those compounds without the above-noted solubilizing groups have been found to be particularly useful for mass application in connection with synthetic fibers. That is to say, that such compounds, i.e., those without solubilizing groups, may be incorporated into the melt and/or applied in dispersed form to synthetics such as, for example, polyesters, polyolefins, polyvinyl, nylon, polyurethanes and the like. It has also been found that the subject 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol compounds are organic solvent pig-

ments and as a result, they have specialized uses, particularly when they are dissolved in organic solvents, resin solutions, or ink formulations and applied to numerous bases for marking purposes. As a result of such application from solution said 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol compounds are useful in detecting, on exposure, ultraviolet light.

It is also noted that U.S. Pat. No. 2,543,333 discloses a 5-amino-2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin compound. It is noted, however, that such compound in all instances is disclosed to have an amino group in the 5-position as distinguished from the subject compounds of the instant invention. Such an amino substituent has a bathochromic effect and hence the compounds disclosed in the above-noted patent will have their absorption maximum in the visible rather than the ultraviolet range. As a result, such a compound cannot be an effective brightening agent and, in fact, such compounds are disclosed to be useful for effecting the growth of neoplasms and myelogenous leukemia. Therefore, while one might suspect that such compounds having such a structure would have fluorescent brightening properties, this is not supported by the above-noted disclosure.

The subject compounds of the instant invention and in particular the 5-amino-2-(4-styrylphenyl)-2H-1,2,3-triazole-4-carboxamide compounds may be prepared according to the following reaction scheme.

A molar quantity of cyanoacetic acid, lower alkyl ester, e.g., ethyl ester, and a molar quantity to about a 10 percent excess of a lower alkyl alcohol, e.g., ethyl alcohol, isopropyl alcohol, methyl alcohol and the like, are mixed preferably in an inert solvent and then cooled to from about above -10° to +10°C. Hydrogen chloride gas is then passed into this mixture in molar quantity or up to an excess of about 10 percent and then the charge maintained at −10° to +10°C. usually for about 10–36 hours. The β-amino-β-ethoxy-acrylic acid, ethyl ester, hydrochloride precipitates and is filtered, and washed with the organic solvent and/or alcohol.

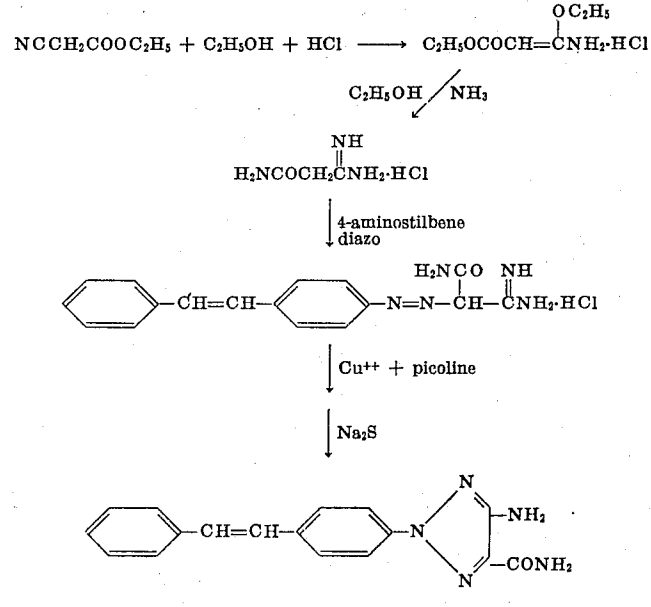
A molar quantity of this product is then slurried with a lower aliphatic alcohol, e.g., ethyl alcohol, and ammonia gas is passed therethrough at about 20° – 35°C. After precipitation is complete the malonamamidine hydrochloride is filtered, washed with ethyl alcohol and dried.

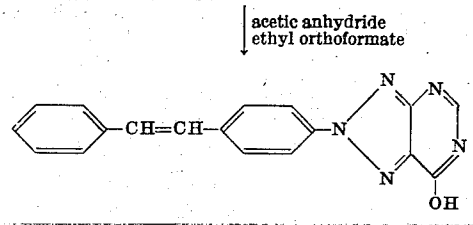
A molar amount of a 4-aminostilbene is then diazotized in a known manner and combined with an approximately molar amount, although an excess of either intermediate up to about 10 percent may be used, of the malonamamidine hydrochloride, at a temperature preferably of about 10° – 30°C. It is desirable to warm the charge up to as high as about 50°C. for several hours, before the charge is adjusted to very slight alkalinity (Pale Congo Blue) with sodium acetate or other suitable alkalizing agent. The charge is maintained at 40° – 50°C for a suitable time, e.g., about 6 to 24 hours while maintaining the pH just to alkaline neutrality. The product is then filtered, washed and dried, thus producing (4-styrylphenyl)azomalonamamidine hydrochloride.

This azo dye is then oxidized in known manner to form a triazole by dissolving in a suitable solvent, usually pyridine or picoline with a small amount of water, and treating same with an excess of cupric salt, e.g., cupric chloride, cupric sulfate pentahydrate and the like.

This treatment is preferably carried out at elevated temperatures, at about 90°C to the reflux. After cooling somewhat, sodium sulfide is added to precipitate the copper salt, and said copper salt is filtered and washed with warm pyridine or picoline. The filtrate is steam distilled, the residue cooled, filtered, washed with alcohol and dried. In some cases the material may be sufficiently insoluble in the pyridine or picoline solution that it is precipitated and can be recovered by filtering without stripping off the solvent by evaporation. A 5-amino-2-(4-styrylphenyl)-2H-1,2,3-triazole-4-carboxamide is thus formed.

Said 5-amino-2-(4-styrylphenyl)-2H-1,2,3-triazole-4-carboxamide is in and of itself a brightening agent. In addition, however, it may also be utilized in the formation of the subject 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol compounds according to the following reaction scheme. The 5-amino-2-(4-styrylphenyl)-2H-1,2,3-triazole-4-carboxamide formed above may be refluxed for approximately 2 – 10 hours in an excess of lower alkyl orthocarboxylate such as, for example, ethyl orthoformate in acetic anhydride. Upon cooling, the product is filtered, washed with an aliphatic alcohol and dried resulting in the formation of the subject 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol compounds. The overall reaction scheme follows the scheme set forth below:





In addition to the foregoing method of preparation, the subject compounds may also be prepared according to the general method disclosed in Hua Hsueh Hsueh Pao 30 (1) 88–90 (1964), described in Chemical Abstracts 38, 1865g. According to the method disclosed therein, a 4-amino-6-hydroxypyrimidine is coupled with 4-aminostilbene diazo and oxidized in boiling pyridine or picoline to give a 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol compound.

Numerous compounds are equivalent to the 4-aminostilbene disclosed in the reaction set forth above and said compounds may be employed in the preparation of the novel compounds of the instant invention. Illustrative of such compounds but not limited thereon are the following:

4-aminostilbene
2-chloro-4-aminostilbene
2',3', and 4'-chloro-4-aminostilbene
2,4'-dichloro-4-aminostilbene
2,2',4'-trichloro-4-aminostilbene
2-cyano-4-aminostilbene
2'-cyano-4-aminostilbene
2-cyano-4'-chloro-4-aminostilbene
2-methoxy-4-aminostilbene
2'-methoxy-4-aminostilbene
4'-methoxy-4-aminostilbene
2',4'-dimethoxy-4-aminostilbene
2-chloro-2',4'-dimethoxy-4-aminostilbene
2-cyano-2'-methoxy-4-aminostilbene
2-methyl-4-aminostilbene
2',3' and 4'-methyl-4-aminostilbene
2',4'-dimethyl-4-aminostilbene
2-chloro-4'-methyl-4-aminostilbene
2-cyano-4'-methyl-4-aminostilbene
4-amino-2-stilbenesulfonic acid
2',4'-dimethoxy-4-amino-2-stilbenesulfonic acid
4-methyl-4-amino-2-stilbenesulfonic acid
2'-chloro-4-amino-2-stilbenesulfonic acid
2'-cyano-4-amino-2-stilbenesulfonic acid
4-amino-2-stilbenecarboxylic acid
4'-chloro-4-amino-2-stilbenecarboxylic acid
4'-cyano-4-amino-2-stilbenecarboxylic acid
2',4'-dimethoxy-4-amino-2-stilbenecarboxylic acid
2'-methyl-4-amino-2-stilbenecarboxylic acid

In addition, in connection with the above-noted reaction, ethyl orthoformate may be substituted by methyl orthoformate, ethyl orthoacetate or methyl or ethyl orthopropionate and the like.

The instant invention will now be illustrated by the following more detailed examples thereof. It is to be noted that the instant invention is not deemed as being limited thereto.

EXAMPLE 1

5-amino-2-(4-styrylphenyl)-2H-1,2,3-triazole-4-carboxamide was prepared as follows.

Step 1

Preparation of β-amino-β-ethoxyacrylic acid, ethyl ester, hydrochloride.

Into a 2-liter flask fitted with stirrer, thermometer, reflux condenser to which was attached a gas exit tube to a caustic scrubbing train, a gas dispersion tube, and an ice-salt bath were added 746 cc. cyanoacetic acid, ethyl ester (7.0 moles), 488 cc. ethyl alcohol (7.7 moles), and 500 cc. ethylene dichloride. The temperature was reduced to −5° to −10°C. 294 g. hydrogen chloride gas (8.05 mole) was introduced. The flask was sealed and kept at an ice bath temperature for 24 hours. The hydrochloride was rapidly filtered with suction and the filter cake washed with a mixture of 300 cc. ethylene dichloride/ethyl alcohol 2:1 and dried in a vacuum desiccator over calcium chloride. 81 percent yield was obtained, m.p = 99°–100°C.

Step 2

Preparation of malonamamidine hydrochloride.

Into a 4-liter autoclave equipped with a stirrer were placed 2000 cc. ethyl alcohol and 391.4 g. β-amino-β-ethoxyacrylic acid, ethyl ester, hydrochloride (2.0 moles). The charge was saturated, under agitation, with ammonia gas under pressure at 25°C. The reaction mixture was stirred at room temperature for 24 hours, and then left to stand without stirring for an additional 24 hours. The hydrochloride was filtered and washed twice with 100 cc. ethyl alcohol. The product was dried in a vacuum desiccator over KOH flakes. The yield was 77.7 percent of theory, m.p. of the crude product was 170.2°–173.0°C.

Step 3

Preparation of (4-styrylphenyl)azomalonamamidine hydrochloride.

Into a 4-liter beaker were charged 67.8 g. 4-aminostilbene (0.348 mole), 132 cc. water, 132 cc. hydrochloric acid (36.5 percent HCl). The charge was covered and heated on a steam bath for 1 hour, stirring occasionally. The steam bath was replaced by an ice bath and the beaker was fitted with stirrer, thermometer and dropping funnel. To this were added 376 g. ice chips, then 65.6 cc. sodium nitrite solution (31.5% $NaNO_2$). The temperature was maintained at 15°–20°C for 2 hours, excess nitrite destroyed with 10 percent aqueous sulfamic acid. To the diazo solution was added a solution of 52.8 g. malonamamidine hydrochloride (0.384 mole) in 75 cc. water. The charge was stirred at room temperature for 1 hour and then at 40° – 45°C for 4 hours. The pH was adjusted to Pale Congo Blue, just off neutral, with 80 g. sodium acetate. The charge was stirred overnight at room temperature. In the morning it was reheated to 40° – 45°C for 8 hours while maintaining the pH at just off Congo neutrality with 20 g. sodium acetate. It was stirred overnight, at room temperature, filtered and washed with 100 cc. 1 percent hydrochloric acid solution, then with cold water, then with methyl alcohol, and dried. The yield was 66.1 percent of theory, with an $A_{max} = 83.5$ at 410 mμ.

Step 4

Preparation of 5-amino-2-(4-styrylphenyl)-2H-1,2,3-triazole-4-carboxamide.

Into a 500 cc. flask equipped with stirrer, thermometer, reflux condenser and heating mantle were charged 200 cc. picoline, 19.7 g (4-styrylphenyl)azomalonamamidine hydrochloride (0.0574 mole) and 25 cc water. The charge was heated to 100°C and when solution was achieved 32.0 g. cupric chloride crystals were added. The charge was stirred 2 hours at 100°C and then cooled to 80°C. 24 g. sodium sulfide flakes were added and then 13.6 g. salt. The charge was reheated to 100°C and clarified through a Celite coated funnel. The cake was washed

with 50 cc. warm picoline. The filtrate was steam distilled and the residue was filtered, washed with cold methanol and air dried. 99.4 percent yield of theory was obtained. The product had a m.p. 232.0° – 233.0°C., A_{max} = 144.7 at 351 mμ.

EXAMPLE 2

2-(4-styrylphenyl)-2H-v-triazole-[4,5-d| pyrimidin-7-ol was prepared as follows:

Into a 250 cc. flask equipped with stirrer, thermometer, reflux condenser and heating mantle were added 90 cc. acetic anhydride (0.955 mole), 90 cc. ethyl orthoformate (0.54 mole) and 15.4 g. 5-amino-2-(4-styrylphenyl)-2H-1,2,3-triazole-4-carboxamide (0.0505 mole) prepared according to Example 1. The charge was refluxed 4 hours, then cooled to 25°C and the solid filtered off. The filter cake was washed with methyl alcohol. 59 percent of theory yield was obtained. Evaporation of the methyl alcohol washings and the original filtrate gave added products. The m.p. of the product, recrystallized from methyl Cellosolve, was 358°–362°C., A_{max} = 148.5 at 346 mμ. Calcd. for $C_{18}H_{13}N_5O$: %C, 68.56; %H, 4.16; %N, 22.21. Found: %C, 68.69; %H, 4.09; %N, 22.32.

EXAMPLE 3

The steps of Examples 1 and 2 were repeated with the exception that the 0.348 mole of 4-aminostilbene was replaced by 0.348 mole 4-methoxy-4-aminostilbene. The azo dye resulting from 3,4-[4-(methoxystyryl)phenyl|azomalonamamidine hydrochloride, had a m.p. 192.0°–200°C., and an A_{max}=74.3 at 410 mμ. The triazole product which resulted from step 4 was 5-amino-2-[4-(4-methoxystyryl)phenyl|-2H-1,2,3-triazole-4-carboxamide. The resultant 2-[4-(4-methoxystyryl)phenyl|-2H-v-triazole[4,5-d|pyrimidin-7-ol thus produced has a m.p. 352°–355°C.

EXAMPLE 4

The steps of Examples 1 and 2 were repeated with the exception that 0.348 moles of 4-aminostilbene was replaced by 0.348 moles of 4-amino-4'-chloro-2-cyanostilbene. As a result, 2-[4-(4-chlorostyryl-2-cyanophenyl)|-2H-v-triazolo[4,5-d|pyrimidin-7-ol was prepared which had a melting point of 355°–356.4°C and an A_{max} of 128.1 at 352 mμ.

EXAMPLE 5

The steps of Examples 1 and 2 were repeated with the exception that the 0.348 mole of 4-aminostilbene was replaced by 0.348 mole 4-amino-2',4'-dichlorostilbene.

The 2-[4-(2,4-dichlorostyryl)phenyl]-5-amino-2H,1,2,3-triazole-4-carboxamide had a melting point of 235° –235.8°C.; A_{max} = 135.3 at 355 mμ; Calcd. for $C_{17}H_{13}Cl_2N_5O$; %C, 54.58; %H, 3.50; %N, 18.71; Found: %C, 54.70; %H, 3.52; %N, 18.40; The 2-[4-(2,4-dichlorostyrylphenyl)|2H-v-triazolo[4,5-d|pyrimidin-7-ol prepared in the manner of Examples 1 and 2 had a melting point above 360°C. Calcd. for $C_{18}H_{11}Cl_2N_5O$; %C, 56.31; %H, 2.89; %N, 18.22; Found: %C, 56.39; %H, 3.02; %N, 17.35.

EXAMPLE 6

The steps of Examples 1 and 2 were repeated with the exception that the 0.348 mole 4-aminostilbene was substituted by 0.348 mole 4-amino-2-stilbenesulfonic acid. The 2-[4-styryl-(3-sulfophenyl)]-5-amino-2H,1,2,3,-triazole-4-carboxamide which resulted had an A_{max} = 96.4 at 352 mμ. The 2[4-styryl-(3-sulfophenyl)|-2H-v-triazole[4,5-d|pyrimidin-7-ol had an A_{max} = 89.9 at 348 mμ.

EXAMPLE 7

The steps of Examples 1 and 2 were repeated with the exception that the 0.348 mole of 4-aminostilbene was replaced by 0.348 mole of 4-amino-2-stilbenecarboxylic acid.

The final products, 2-[4-styryl-(3-carboxyphenyl)|-5-amino-2H,1,2,3-triazole-4-carboxamide and 2[4-styryl-(3-carboxyphenyl)|-2H-v-triazoleo[4,5-d]pyrimidin-7-ol resulted from this series of reactions.

EXAMPLE 8

50 milligrams of the 4-(styrylphenyl)-5-amino-2H,1,2,3,-triazolecarboxamide was dissolved in 100 moles of dimethylformamide. 1.0 ml. of the resulting solution was added to 150 mls. of 0.1% "Peregal O" solution (commercially available ethylene oxide condensation product) as a dispersing agent. This total formulation was poured into a launderometer jar together with a 5.0 gram swatch of cellulose acetate fabric together with 10 steel balls. The material was heated at 190° – 200°F for 45 minutes. The swatch was removed, rinsed and dried. A comparison of this piece of cloth against a piece similarly treated, with the exception that no brightening compound was added, visibly showed an improved brightness of the treated cloth.

EXAMPLE 9

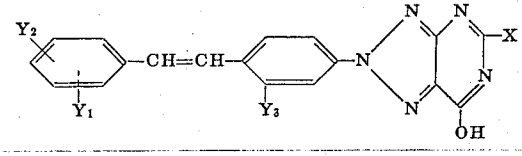
Example 8 was repeated with the exception that 2-(4-styrylphenyl)-2H-v-triazolo[4,5-d]pyrimidin-7-ol was substituted for the triazole derivative, giving commensurate results.

EXAMPLE 10

Marking inks, luminescent under ultraviolet light, were prepared by milling differing amounts of the compound of Example 2 into a commercial ink vehicle. Markings were made from this ink on linoleum and other floor-covering materials and the samples were exposed to ultraviolet light. These samples showed intense fluorescence of a yellow-green hue.

What is claimed is:

1. 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol compound having the formula:



wherein X is selected from the group consisting of a hydrogen and a lower alkyl; Y_1 and Y_2 are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, cyano, halogen, and SO_3Me wherein Me is selected from the group consisting of hydrogen, ammonium, sodium or potassium and Y_3 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, cyano, halogen, COOMe and SO_3Me, wherein Me is selected from the group consisting of hydrogen, ammonium, sodium and potassium.

2. 2-(4-styrylphenyl)-2H-v-triazole[4,5,-d]pyrimidin-7-ol according to claim 1.

3. The 2-(4-styrylphenyl)-2H-v-triazole[4-,5-d]pyrimidin-7-ol compound of claim 1 wherein said compound is 2-[4-(4-methoxystyryl)phenyl]-2H-v-triazolo[4,5-d]pyrimidin-7-ol.

4. The 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin7-ol compound of claim 1 wherein said compound is 2-[4-(4-chlorostyryl-2-cyanophenyl)]-2H-v-triazolo[4,5-d]pyrimidin-7-ol.

5. The 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol compound of claim 1 wherein said compound is 2-[4-(2,4-dichlorostyrylphenyl)]2H-v-triazolo[4,5-d]pyrimidin-7-ol.

6. The 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol compound of claim 1 wherein said compound is 2[4-styryl-(3-sulfophenyl)]-2H-v-triazolo]4,5-d]pyrimidin-7-ol.

7. The 2-(4-styrylphenyl)-2H-v-triazole[4,5-d]pyrimidin-7-ol compound of claim 1 wherein said compound is 2[4-styryl-(3-carboxyphenyl)]-2H-v-triazolo[4,5-d]pyrimidin-7-ol.

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