

July 11, 1967

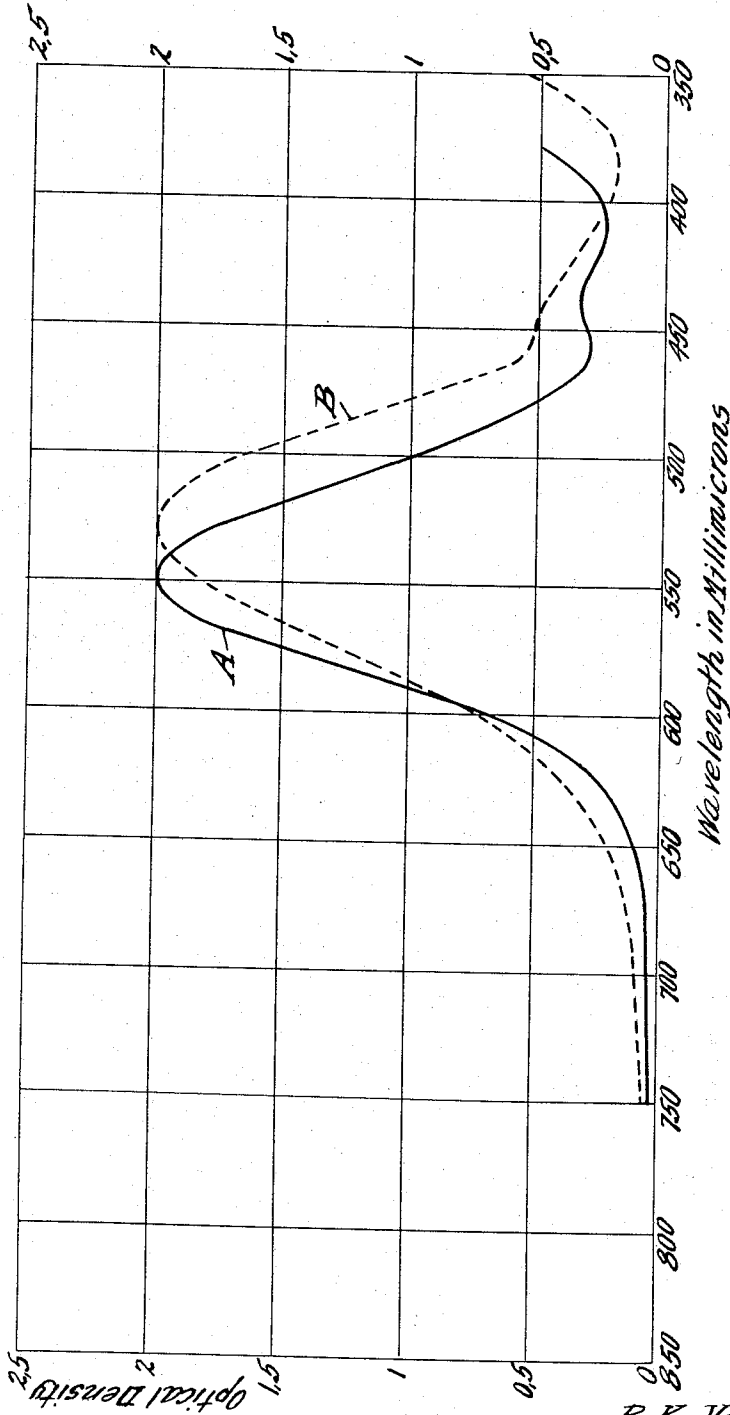
R. K. VAN POUCKE ET AL
METHOD AND MATERIAL FOR PRODUCING
PHOTOGRAPHIC COLOR IMAGES

3,330,660

Filed Oct. 8, 1964

2 Sheets-Sheet 1

FIG. 1-



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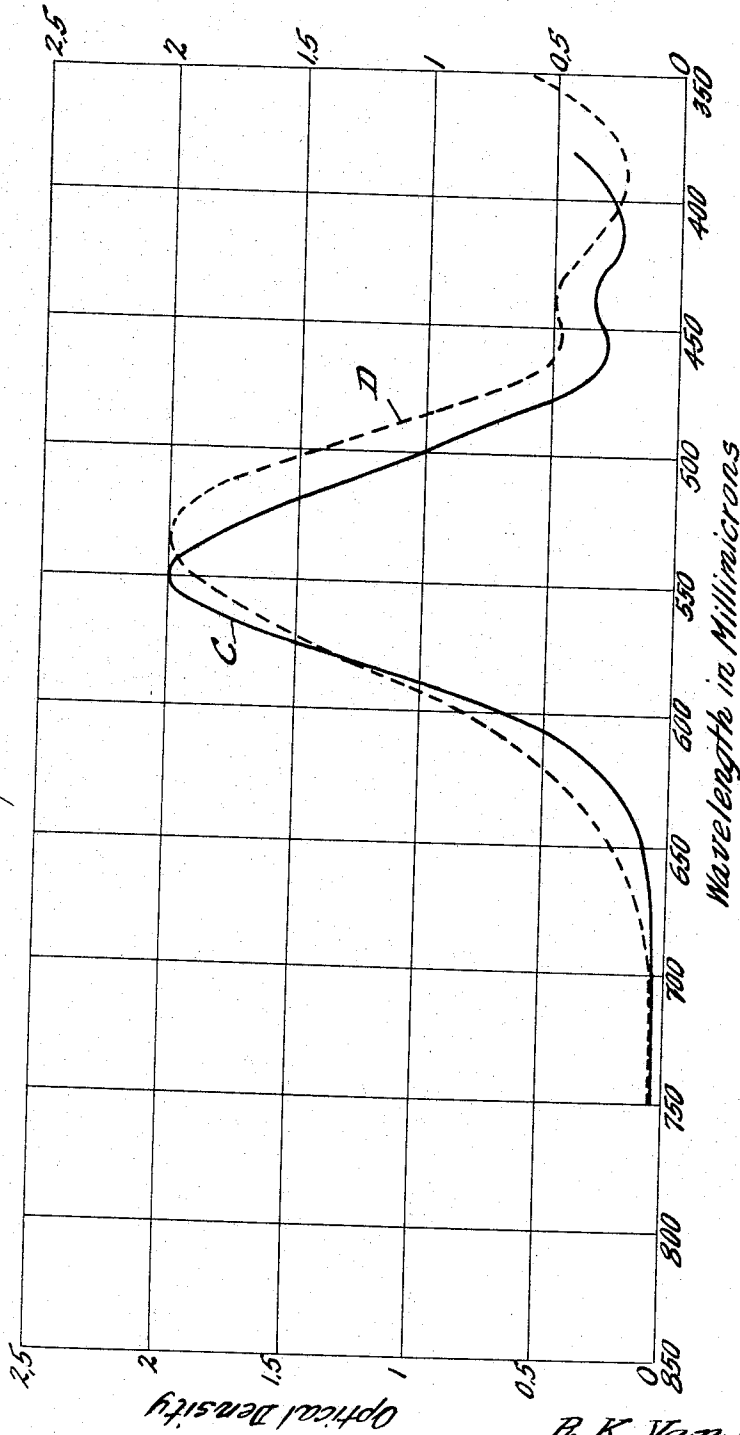
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2 Sheets-Sheet 2

FIG. 2-



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1

3,330,660

METHOD AND MATERIAL FOR PRODUCING PHOTOGRAPHIC COLOR IMAGES

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Claims priority, application Great Britain, Oct. 10, 1963, 39,999/63; Sept. 28, 1964, 39,999/63 (revision)

7 Claims. (Cl. 96—56.5)

The present invention is a continuation-in-part of our application Ser. No. 314,806 filed Oct. 8, 1963, now abandoned.

This invention relates to the production of photographic color images and to photographic materials containing magenta-forming color couplers of the pyrazolone type.

It is known that for the production of a photographic color image in a light-sensitive silver halide emulsion layer the exposed silver halide is developed to a silver image by means of an aromatic primary amino compound in the presence of a color coupler, which by reaction with the oxidized developing substances forms a dye on the areas corresponding with the silver image.

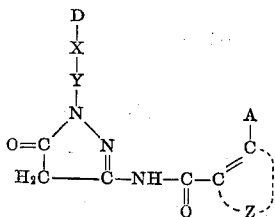
In the subtractive three-color photography mostly a light-sensitive photographic color material is used comprising a red-sensitized, a green-sensitized and a blue-sensitive silver halide emulsion layer, wherein on development by means of suitable color couplers, a cyan, a magenta and a yellow dye image are formed respectively.

As known distinction should be made between color couplers for negative and positive materials e.g. with respect to the absorption spectrum of the dyes to be formed.

The present invention relates to a process for the production of photographic color images by means of color couplers, which on color development with an aromatic primary amine as developing substance form a magenta dye possessing favorable spectral properties for use in negative material.

The present invention also relates to photographic materials comprising said color couplers, by means of which magenta dye images are formed which can be masked e.g. according to the principles for integral masking set forth in the U.S. patent application Ser. No. 71,117, now U.S. Patent No. 3,245,787, of Jozef Frans Willems and Jan Jaeken and the U.S. patent application Ser. No. 296,942 of Jan Jaeken, Roger Alois Spriet, Hugo Vital Van Goethem and Maurice Antoine de Ramaix.

These objects are accomplished by using, in the color development of a latent image of exposed silver halide, color couplers corresponding to the general formula:



wherein:

A is a member selected from the group consisting of a sulfonic acid group and a sulfonate group, e.g. an alkali metal sulfonate group or an ammonium sulfonate group;

Z represents the atoms necessary to complete an aromatic nucleus, which may be further substituted by at least one substituent e.g. a methyl group, a chlorine atom or a bromine atom;

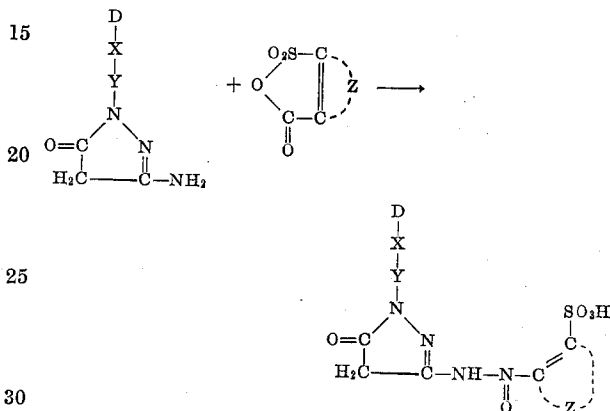
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Y is a bivalent aromatic radical e.g. a phenylene radical or a substituted bivalent aromatic radical e.g. chlorophenylene;

X is a member selected from the group consisting of a sulfur atom, a sulfonyl group, a —SO₂NH— group and a substituted sulfonamide group, e.g. a —SO₂N(CH₃)— group,

D is a radical rendering the color coupler fast to diffusion, such as an acyclic aliphatic radical comprising 5 to 20 carbon atoms.

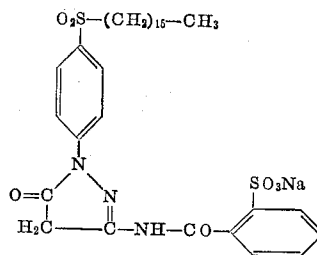
The color couplers used according to the present invention can be prepared according to the following reaction scheme:



wherein:

D, X, Y and Z have the same significance as set forth above.

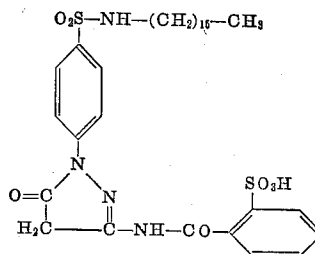
PREPARATION 1



1 - (4 - n - hexadecylsulfonylphenyl) - 3 - (2 - sulfo-benzamido)-2-pyrazolin-5-one sodium salt.

A suspension of 20 g. of o-sulfobenzic anhydride and 46.3 g. (0.1 mole) of 1-(4-n-hexadecylsulfonylphenyl)-3-aminopyrazolin-5-one (prepared as described in the U.S. patent application Ser. No. 314,594) is prepared in 300 ml. of anhydrous benzene. After heating the reaction mixture for 1 hr. on a water bath, 200 ml. of acetonitrile is added. The whole is cooled to room temperature. The resulting precipitate is filtered off, suspended in ethanol and treated with the theoretical quantity of 1 N sodium ethylate, to form the sodium salt of the obtained pyrazolone compound. The sodium salt is separated by filtration and dried. It is a white powder readily soluble in water.

PREPARATION 2

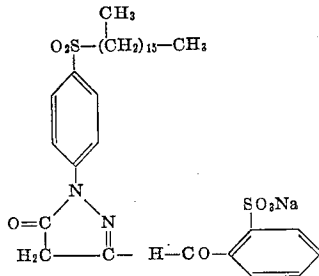


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1 - (4 - n - hexadecylsulfamoylphenyl) - 3 - (2 - sulfo-benzamido)-2-pyrazolin-5-one.

10 g. of o-sulfobenzoic anhydride and 24 g. of 1-(4-n-hexadecylsulfamoylphenyl) - 3-amino-2-pyrazolin-5-one (prepared as described in the U.S. patent application Ser. No. 314,594) are suspended in 100 ml. of anhydrous benzene and heated on a boiling water bath. After heating for 15 minutes 100 ml. of acetonitrile is added, whereupon the resulting precipitate is separated by filtration and dried.

PREPARATION 3



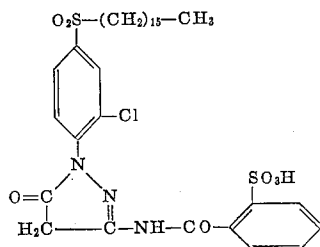
1-[4-(N-methyl-N-hexadecylsulfamoyl) - phenyl]-3-(2-sulfobenzamido)-2-pyrazolin-5-one sodium salt.

(a) 4-(N-methyl-N-hexadecyl-sulfamoyl) - phenylhydrazine is prepared analogously to the preparation of 4-n-hexadecylsulfamoyl-phenylhydrazine (described in the U.S. patent application Ser. No. 314,594) from 4-(N-methyl-N-hexadecylsulfamoyl)-bromobenzene and anhydrous hydrazine, by refluxing said reactants for 25 hours in ethylene glycol monomethylether. Melting point: 94° C.

(b) 1-[4-(N-methyl-N-hexadecylsulfamoyl) - phenyl]-3-amino-2-pyrazolin-5-one.—42.5 g. (0.1 mole) of 4-(N-methyl-N-hexadecylsulfamoyl)-phenylhydrazine and 10.5 g. (0.1 mole) of β-imino-β-ethoxypropionic acid ethyl ester hydrochloride are stirred for 15 min. at room temperature in 100 ml. of pyridine. The mixture is poured into 200 ml. of methyl acetate. The crystalline precipitate is then filtered and dissolved while heating in 150 ml. of ethanol. To the heated solution 70 ml. of 3 N sodium hydroxide are added and after stirring for 10 minutes, the solution is diluted with water and neutralized with acetic acid. The resulting precipitate is filtered off and recrystallized from isopropanol. Melting point: 127° C.

(c) 1-[4-(N-methyl-N-hexadecylsulfamoyl) - phenyl]-3-(2-sulfobenzamido)-2-pyrazolin-5-one sodium salt.—49.2 g. of 1-(4-N-methyl-N-hexadecylsulfamoyl)-phenyl-3-amino-2-pyrazolin-5-one and 18.4 g. of sulfobenzoic anhydride are heated for 2 hours in 200 ml. of benzene. After adding acetonitrile and filtering, the precipitate is dissolved in water and salted out with sodium acetate. The white crystalline precipitate is recrystallized from ethanol.

PREPARATION 4



1-(2-chloro-4-n-hexadecylsulfonylphenyl) - 3-(2-sulfobenzamido)-2-pyrazolin-5-one.

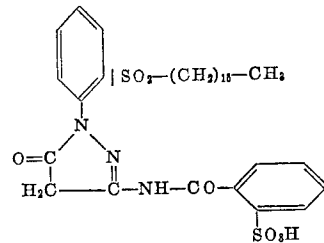
2-chloro-4-n-hexadecylsulfonyl-phenylhydrazine melting at 94° C. is prepared analogously to the process described for 4-N-methyl-N-hexadecylsulfamoyl - phenylhydrazine mentioned in Preparation 3. Starting from this product and analogously to the method described in Preparation 3, 1-(2-chloro-4-n-hexadecylsulfonylphenyl) - 3-amino-2-

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pyrazolin-5-one is obtained which after recrystallization from acetonitrile melts at 126° C.

By condensation of this pyrazolone compound with o-sulfobenzoic anhydride the color coupler having the above-mentioned formula is obtained. Melting point: 255° C.

PREPARATION 5

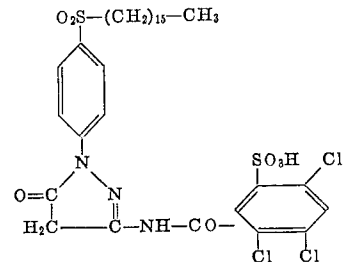


1-(2-n-hexadecylsulfonylphenyl) - 3-(2-sulfo-benzamido)-2-pyrazolin-5-one.

2-n-hexadecylsulfonyl-phenylhydrazine is prepared by allowing to react anhydrous hydrazine with 2-n-hexadecylsulfonyl-bromobenzene and recrystallizing the reaction product from n-hexane. Melting point: 64–65° C. 1-(2-n-hexadecylsulfonylphenyl) - 3-amino-2-pyrazolin-5-one is obtained by reaction of the resulting hydrazine with β-ethoxy-β-amino acrylic acid ethyl ester in dioxane.

After heating for 2 hours on a water bath, the reaction product is treated with sodium ethylate, diluted with water, acidified and recrystallized from n-hexane. Melting point: 129° C. On condensation with o-sulfobenzoic anhydride, the compound with the above-mentioned structural formula is obtained as a white powder melting at 260° C.

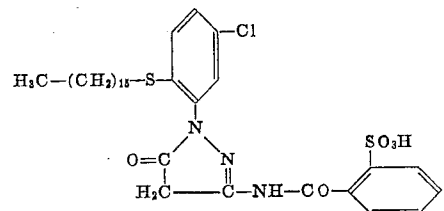
PREPARATION 6



1-(4-n-hexadecylsulfonylphenyl) - 3 - (2-sulfo-3,5,6-trichlorobenzamido)-2-pyrazolin-5-one.

4.7 g. of 1-(4-n-hexadecylsulfonylphenyl)-3-amino-2-pyrazolin-5-one and 2.9 g. of 3,5,6-trichlorosulfobenzoic anhydride are boiled for 15 minutes in 20 ml. of acetic acid. The resulting precipitate is filtered and washed with acetonitrile. Melting point: 250° C.

PREPARATION 7



1 - (2 - n - hexadecylthio-5-chlorophenyl)-3-(2-sulfobenzamido)-2-pyrazolin-5-one.

(a) 3-amino-4-n-hexadecylthio-chlorobenzene.—91 g. of 3-amino-4-mercapto-chlorobenzene, prepared according to Cassey, Sharpe and Stephens, J. Chem. Soc. (1963) 4324, are dissolved in 380 ml. of 10% alcoholic potassium hydroxide. To this solution 175 g. of n-hexadecylbromide are added dropwise, whereby the temperature increases until 85–88° C. The solution is stirred for 1 hour and poured into water. The formed precipitate is collected by filtration and then after being dried dissolved in 2 l.

of 30% alcoholic hydrochloric acid. A crystalline precipitate of amine hydrochloride is obtained on cooling. Melting point: 100-101° C.

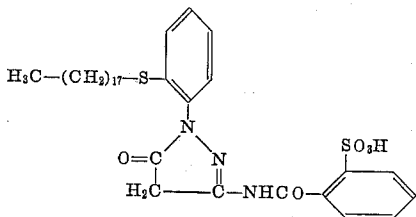
(b) *2-n-hexadecylthio-5-phenylhydrazine*.—295 g. of 2-n-hexadecylthio-5-chloroaniline hydrochloride are dissolved in 2900 ml. of acetic acid and 142 ml. of concentrated hydrochloric acid. At 27° C. 125 ml. of isoamyl nitrite are added whereupon the solution is stirred for 30 minutes at 27-30° C. The obtained diazonium salt solution is added dropwise at 5° C. to a solution of 370 g. of tin(II) chloride dihydrate in 370 ml. of concentrated hydrochloric acid. After stirring the suspension for 1 hour at 10°, it is heated to 65° C. until complete dissolution. Then 700 g. of ice are added. The formed precipitate is filtered off and dissolved in 1. l. of hexane. Yield: 192 g. of hydrochloride. Melting point: 107° C.

By treating this hydrochloride with the theoretic amount of alcohol potassium hydroxide while heating, the free 2-n-hexadecylthio-5-chloro-phenylhydrazine is obtained. Melting point: 40° C.

(c) *1-(2-n-hexadecylthio-5-chlorophenyl)-3-amino-2-pyrazolin-5-one*.—20 g. of the prepared 2-n-hexadecylthio-5-chloro-phenylhydrazine are melted with 10 g. of β -amino- β -ethoxyacrylic acid ethyl ester on a water bath of 80° C. To the melt are added 3 drops of acetic acid, whereupon it is allowed to cool until room temperature. After 30 minutes 100 ml. of 5% aqueous sodium methylate are added and 15 minutes later the mixture is diluted with 100 ml. of water and acidified with acetic acid. The precipitate formed is extracted with benzene. After evaporation of this solvent, the residue is recrystallized from isopropyl ether. Yield: 15 g. Melting point: 100° C.

(d) *1-(2-n-hexadecylthio-5-chlorophenyl)-3-(2-sulfobenzamido)-1-pyrazolin-5-one*.—23 g. of the prepared 1-(2-n-hexadecylthio-5-chlorophenyl)-3-amino-2-pyrazolin-5-one and 10.5 g. of o-sulfobenzoic anhydride are dissolved in 160 ml. of benzene on a boiling water bath. After 30 minutes 100 ml. of acetonitrile are added and the formed precipitate is filtered off. Yield: 27 g. Melting point: above 250° C.

PREPARATION 8



1-(2-n-octadecylthiophenyl)-3-(2-sulfobenzamido)-2-pyrazolin-5-one.

This compound is prepared analogously to that of Preparation 7. Melting point: above 250° C.

The color couplers used according to the present invention, on color development form dyes possessing in respect of known 1-aryl-3-acylamino-2-pyrazolin-5-ones a low side-absorption for red light. As mentioned above the color couplers according to the general formula given above are suited for the formation of an integral dye mask-image in the developed color negative.

According to the processes described in the U.S. patent specifications 3,012,884; 3,013,879 and 3,047,385 and in the U.S. patent applications Ser. Nos. 71,117 (now U.S. Patent No. 3,245,787); 100,010 (now U.S. Patent No. 3,245,788); 278,453 and 296,942, the mask images are formed in the color negative itself, hence the name integral mask images. These mask images have a gradation opposite to that of the dye images formed on color development and a light absorption in a wavelength region wherein the dye images formed on color development have an undesirable absorption. When printing such an

integrally masked color negative on a light-sensitive positive color material, spectrally right color prints are obtained, since the mask image and the proper exposure technique on printing eliminate by compensation the deleterious influence of the side-absorptions of the negative color image formed on color development.

The formation of an integral mask image according to the processes described in the mentioned U.S. patent specifications and applications is based on the suitability of determined color couplers to be coupled in an oxidizing medium such as an alkaline photographic bleaching bath with oxidatively coupling compounds also described therein.

For instance, in order to form in a photographic material containing a 2-pyrazolin-5-one color coupler according to the above general formula an integral masking dye image, which compensates the side-absorption in the blue of the primary magenta dye image formed on development, the unaltered 2-pyrazolin-5-one color coupler on the non-exposed areas of the photographic material after color development is oxidatively coupled, e.g. in the photographic bleaching bath, with a suited oxidatively coupling compound so as to form a yellow dye. In this way, in the photographic material itself a yellow mask image is formed having a gradation opposite to that of the primary magenta dye image.

The magenta forming color couplers according to the above formula usually are added to a green-sensitized silver halide emulsion. According to the most applied embodiment this silver halide emulsion is coated as the second color coupler containing layer of a multilayer photographic color material. Such a photographic multilayer color material usually consists in the indicated sequence of a support, a red-sensitized silver halide emulsion layer containing a cyan-forming color coupler, a green-sensitized silver halide emulsion layer containing a magenta-forming color coupler, a yellow filter layer mostly consisting of colloidal silver dispersed in gelatin, and a blue-sensitive silver halide emulsion layer containing a yellow-forming color coupler.

According to a preferred embodiment applied in the production of a photographic multilayer color material, the 2-pyrazolin-5-one color coupler according to the above general formula together with an oxidatively coupling compound also named masking compound preferably an oxidatively coupling compound according to the general formula described in the U.S. patent application Ser. No. 296,942 is incorporated in a non-migratory form in the green-sensitized silver halide emulsion layer.

The support of this photographic multilayer color material may consist of paper, glass, cellulose nitrate, a cellulose ester such as cellulose triacetate, a polyester, polystyrene or another synthetic or natural resin.

In the development of exposed photographic silver halide emulsion layers, using the couplers described above, any color-forming developer containing a primary amino group may be used. These include developers having two primary amino groups as well as those having one of the amino groups substituted or having substituents in the ring such as alkylphenylene diamines. These compounds are usually used in the salt form such as the hydrochloride or the sulfate, which are more stable than the amines. All of these compounds have an unsubstituted amino group which enables the oxidation products of the developer to couple with the color forming compounds to form a dye.

Suitable developing substances are aromatic primary amino compounds such as p-phenylenediamine and derivatives thereof such as N,N-diethyl-N'-sulfomethyl-p-phenylenediamine and N,N-diethyl-N'-carboxymethyl-p-phenylenediamine.

The accompanying drawings represent the absorption curves of a dye obtained by means of a color coupler according to the general formula described above and of dyes obtained with known 3-acylamino-2-pyrazolin-5-

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one couplers of the type described in U.S. patent specification 2,694,718.

FIGURE 1 represents the absorption curves A and B of the dyestuffs, which are formed on development with N,N-diethyl-p-phenylenediamine of two silver halide emulsion layers respectively containing the color couplers having the following structural formulae:

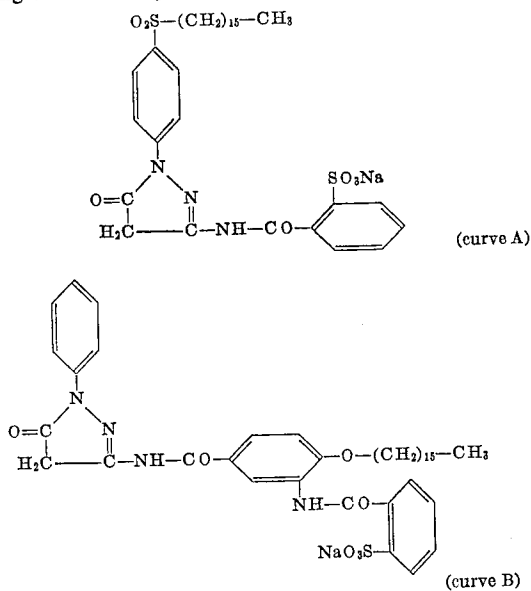
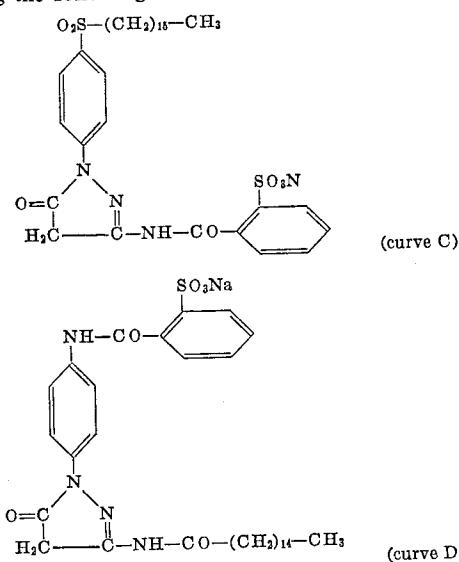


FIGURE 2 represents the absorption curves C and D of the dyestuffs, which are formed on development with N,N-diethyl-p-phenylenediamine of two silver halide emulsion layers respectively containing the color couplers having the following structural formulae:



The following examples illustrate the invention.

Example 1

To ½ kg. of a green-sensitive silver bromo-iodide (3 mol percent of iodide) emulsion containing 0.112 mol of silver halide is added at 45° C. 6 g. of the color coupler of preparation 1 dissolved by heating to 60° C. in a mixture of 27 ml. of ethanol, 30 ml. of distilled water and 3 ml. of 2 N aqueous sodium hydroxide. After acidification with acetic acid to pH 6 and after addition of the usual additives such as hardeners, wetting agents, stabilizers and the necessary amount of distilled water to obtain 1 kg. of emulsion, the latter is coated at a coverage of 10 sq.m. per kg. on a cellulose triacetate support and dried. After exposure through a grey wedge

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with a constant 0.15, the photographic material is developed for 8 minutes at 20° C. in a color developing bath of the following composition:

N,N-diethyl-phenylenediamine hydrochloride	g--	2.75
Hydroxyamine hydrochloride	g--	1.2
Anhydrous sodium hexametaphosphate	g--	1
Anhydrous potassium carbonate	g--	75
Anhydrous sodium sulfite	g--	2
Potassium bromide	g--	0.5
Water to make	l--	1

The developed material is treated for 4 minutes in a stop bath of the following composition:

Potassium alum	g--	15
Acetic acid	cm. ³ --	10
Borax	g--	21
Water to make	l--	1

The material is rinsed for 10 minutes with water and then treated in a fixing bath of the following composition:

Sodium thiosulfate-5-water	g--	200
Anhydrous potassium metabisulfite	g--	25
Potassium alum	g--	15
Boric acid	g--	7.5
Water to make	l--	1

After fixing the material is treated in a bleaching bath of the following composition:

Borax	g--	22
Anhydrous potassium bromide	g--	14
Anhydrous sodium bisulfite	g--	4
Potassium hexacyanoferrate(III)	g--	100
Water to make	l--	1

After bleaching, the material is rinsed with water for 6 minutes and fixed for another 6 minutes in a bath with the following composition:

Anhydrous sodium hexametaphosphate	g--	1
Anhydrous sodium thiosulfate	g--	130
Anhydrous sodium sulfite	g--	10
Anhydrous sodium carbonate	g--	6
Anhydrous sodium bicarbonate	g--	14
Water to make	l--	1

After a final rinsing the material is dried.

45 A magenta colored wedge image is obtained having an absorption maximum at 550 mμ.

Example 2

To ½ kg. of a green-sensitive silver bromo-iodide (3 mol percent of iodide) emulsion containing 0.115 mol of silver halide is added a mixture of a solution of 6 g. of the color coupler of Preparation 1 and a solution of 4 g. of 1-phenyl-4-methyl-2-quinolone-n-hexadecylsulfonilhydrazone, a masking compound described in the U.S. patent application Ser. No. 296,942. For that purpose the color coupler is first dissolved in a mixture of 27 ml. of ethanol, 30 ml. of distilled water and 3 ml. of 2 N aqueous sodium hydroxide, and the mask forming compound first dissolved in a mixture of 40 cm.³ of diacetone alcohol, 9 cm.³ of 2 N aqueous sodium hydroxide and 32 cm.³ of distilled water. After acidification with acetic acid to pH 6 and after addition of the usual ingredients such as hardeners, wetting agents, stabilizers, and the necessary amount of distilled water to obtain 1 kg. of emulsion, the latter is ready to be coated. After coating, the emulsion forms part of a multilayer photographic material comprising the following superposed layers in the indicated sequence: a support, an antihalation layer, a gelatin insulating layer, a red-sensitized silver halide emulsion layer containing a cyan-forming color coupler, a gelatin interlayer, a layer of the above mentioned green-sensitized silver halide emulsion, a yellow filter layer, a blue-sensitive silver halide emulsion layer containing a yellow-forming color coupled and at last a gelatin overcoat as antistress layer.

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After exposure through a grey wedge with a constant 0.15, the photographic material is developed and further treated as in Example 1. In the green-sensitized emulsion layer a negative magenta colored image is obtained together with a yellow dye mask image which possesses an opposite gradation to that of the magenta dye image and which reduces the disturbing influence in the printing process of the side-absorption in the blue of the formed magenta dye image.

Example 3

In a similar green-sensitized silver halide emulsion as described in Example 2, the color coupler is replaced by a same amount of the color coupler of preparation 3 dissolved in a mixture of 28 cm.³ of distilled water and 12 cm.³ of ethanol. The emulsion is coated and processed as described in Example 2. In the green-sensitized silver halide emulsion layer a negative magenta colored image is obtained together with a yellow dye mask image being of opposite gradation to that of the magenta dye image and reducing in the printing process the disturbing influence of the side-absorption in the blue of the primarily formed magenta dye image.

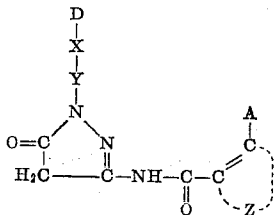
Example 4

To ½ kg. of a green-sensitive silver bromo-iodide (3 mol percent of iodide) emulsion containing 0.112 mol of silver halide is added at 45° C. 6 g. of the color coupler of Preparation 8 dissolved in a mixture of 12 ccs. of 1 N ethanolic potassium hydroxide and 108 ccs. of distilled water. After acidification with acetic acid to pH 6 and after addition of the usual additives such as hardeners, wetting agents, stabilizers and the necessary amount of distilled water to obtain 1 kg. of emulsion, the latter is coated at a coverage of 10 sq.m. per kg. on a cellulose triacetate support and dried. After exposure through a grey wedge with a constant 0.15, the photographic material is developed and further treated as described in Example 1.

A magenta colored wedge image is obtained having an absorption maximum at 540 mμ.

We claim:

1. A method of producing a magenta colored photographic image in a silver halide emulsion layer, which comprises exposing the layer and developing it in the presence of a coupler compound having the following general formula:



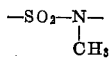
wherein:

A is a member selected from the group consisting of sulfonic acid group and a sulfonate group,

Z represents the atoms necessary to complete an aromatic nucleus,

Y is a bivalent aromatic radical,

X is a member selected from the group consisting of sulfur, sulfonyl, —SO₂NH— and



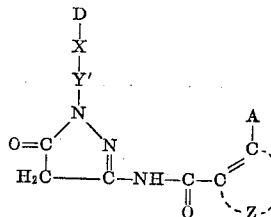
and

D is an acyclic aliphatic radical comprising 5 to 20 carbon atoms.

2. A method of producing a magenta colored photographic image in a silver halide emulsion layer, which comprises exposing the layer and developing it while con-

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taining a coupler compound having the following general formula:

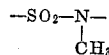


wherein:

A is a member selected from the group consisting of sulfonic acid and sulfonate,

Z represents the atoms necessary to complete an aromatic nucleus,

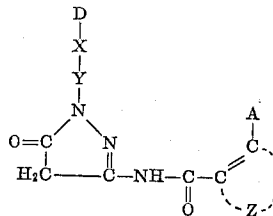
X is a member selected from the group consisting of sulfur, sulfonyl, —SO₂NH— and



D is an acyclic aliphatic radical comprising 5 to 20 carbon atoms, and

Y' is a phenylene radical.

3. A photographic emulsion for preparing a photographic element for forming colored images comprising a water-permeable colloid as carrier for light-sensitive silver halide and a color coupler having the general formula:



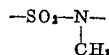
wherein:

A is a member selected from the group consisting of sulfonic acid group and a sulfonate group,

Z represents the atoms necessary to complete an aromatic nucleus,

Y is a bivalent aromatic radical,

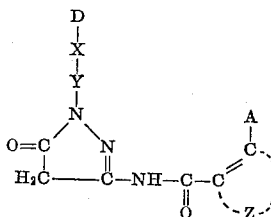
X is a member selected from the group consisting of sulfur, sulfonyl, —SO₂NH— and



and

D is an acyclic aliphatic radical comprising 5 to 20 carbon atoms.

4. A photographic element containing at least one silver halide emulsion layer and a coupler compound having the following general formula:



wherein:

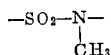
A is a member selected from the group consisting of sulfonic acid group and a sulfonate group,

Z represents the atoms necessary to complete an aromatic nucleus,

Y is a bivalent aromatic radical,

11

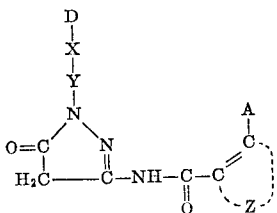
X is a member selected from the group consisting of sulfur, sulfonyl, $-\text{SO}_2\text{NH}-$ and



and

D is an acyclic aliphatic radical comprising 5 to 20 carbon atoms.

5. A photographic element containing at least one silver halide emulsion layer, which contains a coupler compound for magenta having the following general formula:



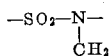
wherein:

A is a member selected from the group consisting of sulfonic acid group and a sulfonate group,

Z represents the atoms necessary to complete an aromatic nucleus,

Y is a bivalent aromatic radical,

X is a member selected from the group consisting of sulfur, sulfonyl, $-\text{SO}_2\text{NH}-$ and

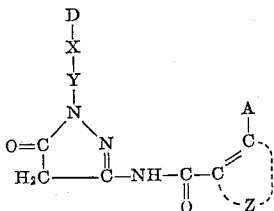


and

D is an acyclic aliphatic radical comprising 5 to 20 carbon atoms,

and an oxidatively coupling compound, which on the oxidizing treatment of the photographic element in the bleaching bath oxidatively couples with the said coupler compound for magenta to form a dye absorbing in at least one region of the side-absorptions of the magenta dye, which is formed with the said coupler compound for magenta in the color development of the photographic element with a primary aromatic amino developing agent.

6. A photographic element according to claim 5 containing at least one green-sensitized silver halide emulsion layer, which contains a coupler compound for magenta having the following general formula:



wherein:

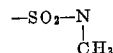
A is a member selected from the group consisting of sulfonic acid group and a sulfonate group,

Z represents the atoms necessary to complete an aromatic nucleus,

12

Y is a bivalent aromatic radical,

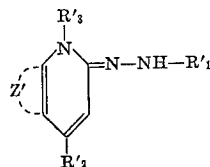
X is a member selected from the group consisting of sulfur, sulfonyl, $-\text{SO}_2\text{NH}-$ and



5

and

D is an acyclic aliphatic radical comprising 5 to 20 carbon atoms, and an oxidatively coupling compound corresponding to the following general formula:



15

wherein:

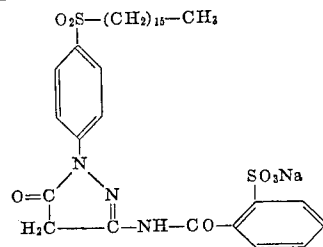
20 R'1 is a labile functional substituent adapted to be split off by said oxidizing treatment,

R'2 and R'3 are selected from the group consisting of an alkyl radical, an aryl radical and an aralkyl radical, and

25 Z' represents the non-metallic atoms necessary to close an aromatic nucleus of the benzene series.

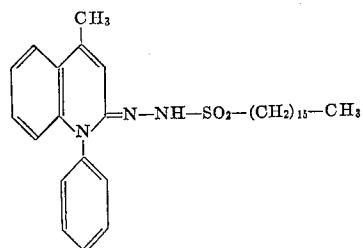
7. A photographic element containing at least one green-sensitized silver halide emulsion layer comprising as coupler compound for magenta the compound having the following structure:

30



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and as masking compound the compound having the following structure:



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References Cited

UNITED STATES PATENTS

2,353,205	7/1944	Vittum et al.	96-100
2,369,489	2/1945	Porter et al.	96-100
3,245,787	4/1966	Willems et al.	96-9

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