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DIAZOTYPES CONTAINING DIAZOSULFONATES

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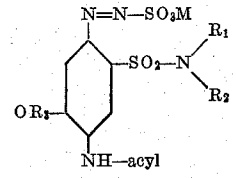
In colour photography by the subtractive tricolour process, three coloured images are formed, of which the shades are generally yellow, blue-green and purple. These images can be formed in a single layer or in several layers which are afterwards superimposed. One of the methods of carrying out such a process consists in developing the images under the action of light, for example after passage of the latter through a negative, and to this end can be used sensitive layers containing the mixture of a diazo sulphonate and of a coupling component, for example a phenol. These products are used in solution and are eliminated by washing after exposure.

This process necessitates therefore the use of diazo sulphonates and phenolic substances sufficiently soluble in the solvents which are used for treatment and for the washing of the images. These solvents are generally water or aqueous solutions. The dyestuffs formed should be, on the contrary, insoluble in the same solvents. Coupling under the action of light should be rapid and lead to dyestuffs of bright and intense shades of which the light absorption curves should as far as possible lie in and extend over the zones of the spectrum defined by the tricolour filters employed, which are generally blue, red and green. These conditions have not been well realized up to the present for the purple image. Now it has been found that excellent results are obtained by using as diazo sulphonates those having the general formula



in which R_1 and R_2 represent alkly, cycloalkyl, aryl or aralkyl residues, R_3 represents an alkyl residue, acyl represents the residue of a carboxylic acid and M an equivalent of a metal conferring solubility in water for example an alkali metal.

To form the solid layer destined to the formation of the purple image, there is used, according to the invention a mixture of a diazosulphonate having the above general formula and of an arylide of 2-hydroxy-3-naphthoic acid.

The shade obtained is often changed considerably by passage of the image through a solvent, such as ethyl alcohol, which is imiscible with water and more or less diluted with the latter

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liquid. Certain mixtures only furnish suitable purpose shades after this treatment, and preliminary experiments, easy to carry out, should be made to determine whether this is necessary in any particular case.

Example 1

A film, covered with a layer of gelatine slightly tanned with an aluminium salt, is plunged for two minutes in a solution diluted to one litre with water which contains 19 gr. of 3-methoxy-4-benzoylamino - 6 - diethylsulphonamido - benzenediazo sulphonate of sodium and 6 grams of (2^1 - hydroxy - 3^1 - naphthoyl - 1) - amino - 3 - nitrobenzene, 16 cc. of alcohol and 3 cc. of aqueous caustic soda of 38° Bé. It is exposed, preferably in a moist state, under a negative, to produce in its surface an image of the latter. The duration of the exposure is adjusted according to the light used, which may be either natural or artificial. It is washed with a slightly alkaline aqueous solution and then with water and plunged into 90% alcohol and dried. The proof is of a bright purple, well adapted to three-colour work. The foregoing diazo sulphonate is prepared starting with 50 gr. of 3 methoxy-4-benzoylamino-6-diethylsulphonamido-aniline which is diazotised with 37.5 cc. of 20° Bé. hydrochloric acid 12.5 g. of sodium nitrite, and made up with water to a volume of 1500 cc. The solution obtained is then poured into a cold solution of 41 gm. of sodium carbonate and 18 g. of sodium sulphite in 300 cc. of water. It is salted out and the precipitate obtained is decanted.

If in the above example the passage through alcohol is dispensed with, the purple image is more bluish. On the contrary, even when the passage through alcohol is omitted, redder shades are obtained by replacing the coupling component by one of the following products:

1-(2^1-hydroxy-3^1-naphthoyl) amino-2-methyl-4-chlorobenzene.
(2^1-hydroxy-3^1-naphtholy) aminobenzene.
(2^1-hydroxy-3^1-naphthoyl) amino-2-methylbenzene.
(2^1-hydroxy-3^1-naphthoyl) amino-4-chlorobenzene.
(2^1-hydroxy-3^1-naphthoyl) amino-2: 4-dimethoxy-5-chlorobenzene.
(2^1-hydroxy-3^1-naphthoyl) amino-2: 5-dimethoxybenzene.
(2^1-hydroxy-3^1-naphthoyl) amino-2-methoxy-5-chlorobenzene,

Redder shades are also obtained whether the

treatment with alcohol is carried out or not when a mixture is used containing the foregoing diazo sulphonate and the following coupling components.

1-(2^1 - hydroxy - 3^1 - naphthoyl) amino - 2 - ethoxybenzene.

(2^1 - hydroxy - 3^1 - naphthoyl) amino - 2 - methoxybenzene.

A shade very similar to that given in Example 1 is obtained when the treatment with alcohol is carried out and the mixture sensitive to light contains (2^1-hydroxy-3^1-naphthoyl) amino-2:4-dimethoxy-5-chlorobenzene or (2^1-hydroxy-3^1-naphthoyl)- amino-2- methoxy-5- chlorobenzene. The shade is bluer when the treatment with alcohol is carried out and the mixture contains one of the following products:

1-(2^1-hydroxy-3^1-naphthoyl) aminonaphthalene
2-(2^1-hydroxy-3^1-naphthoyl) aminonaphthalene
1-(2^1-hydroxy-3^1-naphthoyl) amino-4-methoxybenzene
(2^1-hydroxy-3^1-naphthoyl) amino-2-methyl-4-chlorobenzene
(2^1-hydroxy-3^1-naphthoyl) amino-4-chlorobenzene

Example 2

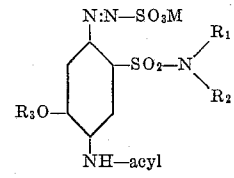
Shades very close to those given by the diazosulphonate of Example 1 are obtained when it is replaced by 3-ethoxy-4-benzoylamino-6-diethylsulphonamido-benzenediazo sulphonate of sodium, using as the coupling component one of the following compounds:

1-(2^1-hydroxy-3^1-naphthoyl) aminonaphthalene
(2^1-hydroxy-3^1- naphthoyl) amino-2- methylbenzene
(2^1-hydroxy-3^1- naphthoyl) amino -4- chlorobenzene

The diazosulphonate is prepared by a method corresponding to that for the diazosulphonate of Example 1, i. e. by diazotisation of 3-ethoxy-4-benzoylamino - 6- diethylsulphonamido - aniline and treatment with a mixture of sodium carbonate and sodium sulphite.

We declare that what we claim is:

1. A light-sensitive layer which gives on exposure to light a purple image suitable for subtractive three-colour photography and containing a mixture of an arylide of 2-hydroxy-3-naphthoic acid and a diazo-sulphonate having the general formula



wherein

R_1, R_2 and R_3 each represents an alkyl group,
Acyl represents the residue of a carboxylic acid and
M represents an equivalent of a metal conferring solubility in water.

2. A light-sensitive layer which gives on exposure to light a purple image suitable for subtractive three-colour photography and containing a mixture of an arylide of 2-hydroxy-3-naphthoic acid and a 3-methoxy-4-benzoylamino-6-diethylsulphamidobenzenediazo sulphonate of an alkali metal.

3. A light-sensitive layer which gives on exposure to light a purple image suitable for subtractive three-colour photography and containing a mixture of an arylide of 2-hydroxy-3-naphthoic acid and a 3-ethoxy-4-benzoylamino-6-diethylsulphamidobenzenediazo sulphonate of an alkali metal.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,934,011	Schmidt et al.	Nov. 7, 1933
2,206,611	Lantz	July 2, 1940
2,233,038	Sus et al.	Feb. 25, 1941
2,465,760	Sprung et al.	Mar. 29, 1949