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LIGHT-SENSITIVE LAYER

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The present invention relates to light-sensitive layers on a suitable base containing diazo compounds of aromatic amino-acylamines, more particularly the diazo compound from 1-amino-2.5-diethoxy-4-benzoylaminobenzene.

It is already known that diazo compounds are suitable for the preparation of photographic pictures. There were hitherto used mainly two processes. According to one of these processes a diazo compound is applied alone on a base and developed after exposure to light by means of a solution of an azo component. According to the other process light-sensitive layers are used which contain the diazo component as well as the azo component. The latter process has the advantage that the copies can be developed in a dry manner (by means of ammonia gas), so that pictures of a right measure are formed. There is no danger that the lines run during the development. The first process is quite different, for when treating with the solution of the azo component the lines very easily run, which, however, can be more or less avoided by addition of salts.

Now we have found that for the preparation of light-sensitive layers and diazo copies thereof, diazo compounds are particularly well suitable which contain in the aromatic nucleus besides the diazo group also an acylamino-group; it is of no consequence whether the diazo compound is applied together with the azo component and then developed with an alkaline bath, or whether the diazo compound is applied alone and developed after the exposure to light with an alkaline solution which simultaneously contains an azo component. The said diazo compounds have not only a very good stability and sensitiveness to light, but they yield dyestuff-pictures which are especially fast to light. The acyl residue may for instance be an acetyl group, a benzoyl group or a naphthoyl group. Two amino groups can also be connected by carbonic acid residues or by thiocarbonic acid residues, or by residues of other polyvalent acids e. g. succinic acid; for instance diazo compounds and tetrazo compounds of aromatic urea or thiourea are suitable. The aromatic residue having the diazonium group attached may be substituted. Preferably hydroxy-alkyl-groups have proved to be suitable substituents.

The following examples serve to illustrate the invention, but they are not intended to limit it thereto, the parts being by weight, unless otherwise stated.

1. 20 parts of the tin chloride double salt of the tetrazo compound of diaminodiphenyl-thiourea, 30 parts of tartaric acid, 20 parts of boric acid, and 15 parts of thiourea are dissolved with water of about 35° C. so that 1000 cc. are obtained and the whole is filtered. The solution is applied on paper or the like and dried.

After exposure to light under a pattern the picture is developed by means of a solution of 5 grams of phloroglucine and 50 grams of borax in 1000 cc. of water. Brownish-yellow pictures on a white ground are obtained.

2. 15 parts of the tetrazo compound of diaminotetra-methoxydiphenylurea, 20 parts of tartaric acid, and 30 parts of thiourea are dissolved together with water of about 35° C. so that 1000 cc. are obtained. The solution is spread as usual on paper, fabrics or the like and dried. After exposure to light under a pattern the copy is developed with a solution containing 5 grams of phloroglucine and 50 grams of borax in 1000 cc. of water.

Deeply dark brown pictures of an excellent fastness to light are obtained on a white ground.

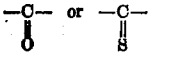
Instead of 50 grams of borax there can be used other alkalies, for instance a mixture of 25 grams of borax, 15 grams of disodium

phosphate and 10 grams of sodium bicarbonate.

When developing with a solution of 5 grams of 2.7-dihydroxynaphthalene and 50 grams of borax in 1000 cc. of water, violet-blue pictures are obtained of a good fastness to light. By substituting for 2.7-dihydroxynaphthalene the same quantity of 1.7-aminonaphthol or 2-hydroxynaphthalene-8-biguanide, the shades become greenish-blue.

The said diazo compounds may, of course, be applied together with azo dyestuff components in order to obtain light-sensitive layers. Such layers may be developed after exposure to light in dry or wet or moist manner.

In the preceding examples there may stand in the diazo compound instead of the



residue also a residue of a polybasic acid as for instance the residue $-CO.CH_2.CH_2.CO-$.

3. 30 parts of tartaric acid, 40 parts of boric acid, 50 parts of thiourea, 40 parts of naphthalene-trisulfonic acid, 5 parts of ammonium sulfate, 10 parts of the hydrochloride of 1-hydroxynaphthalene-7-biguanidine and 9.3 parts of the zinc chloride double salt of the diazo compound from 1-amino-2.5-diethoxy-4-benzoylaminobenzene (in about one liter of water) and the solution is spread on paper, film or a similar base. After exposure to light under a pattern there are obtained by developing with ammonia gas or an aqueous sodium carbonate solution of about 10 per cent strength copies with blue lines on a white ground which are fast to water and of an excellent fastness to light.

4. 20 parts of tartaric acid, 30 parts of boric acid, 40 parts of thiourea, 10 parts of the diazo compound obtained according to Example 3 are dissolved in about 1 liter of water. After having applied the solution on a suitable base and exposed to light there is obtained by a treatment with an alkaline solution of phloroglucine a reddish-brown picture, by a treatment with 1.7-aminonaphthol a bluish-gray picture, with 2.7-dihydroxynaphthalene a reddish-violet picture, with 1.7-hydroxynaphthalene-biguanidine a blue picture.

5. 20 parts of tartaric acid, 30 parts of boric acid, 40 parts of thiourea, 20 parts of aluminium sulfate, 15 parts of zinc chloride double salt of the diazo compound from 1-amino-2.5-dimethoxy-4-benzoylaminobenzene calculated upon 1000 parts by volume of water and the whole is spread in the usual manner on a base, for instance paper. After exposure to light this is developed with alkaline solutions of for instance beta-naphthol or resorcin or 1-hydroxynaphthalene-7-biguanidine or 1-hydroxynaphthalene-7-phenylguanidine, while preferably adding a small quantity of a wetting agent, such as for instance saponine, or a commercial substance acting in a similar manner. There are obtained red, reddish-violet and blue tones. By applying together the developing substances mixed tones, of course, can also be obtained.

For the benzoyl residue there may be substituted another aromatic acid residue or the acetyl residue or a residue of a higher aliphatic or aliphatic-aromatic acid.

The hydrogen atom of the amino group can in the preceding examples always be replaced by an alkyl, aryl or aralkyl residue.

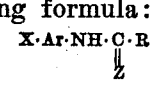
We claim:

1. As new products, light-sensitive layers on a suitable base, containing diazo compounds of aromatic amino-acylamines.

2. As new products, light-sensitive layers on a suitable base, containing compounds of the following formula:

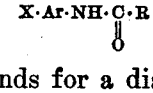
wherein X stands for a diazonium residue, Ar for an aryl residue substituted or not, Y for hydrogen, alkyl, aryl or aralkyl, Z for O= or S= and R for alkyl, aryl or NH-aryl.

3. As new products, light-sensitive layers on a suitable base, containing compounds of the following formula:



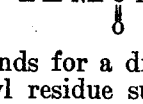
wherein X stands for a diazonium residue, Ar for an aryl residue substituted or not, Z for O= or S= and R for alkyl, aryl or NH-aryl.

4. As new products, light-sensitive layers on a suitable base, containing compounds of the following formula:



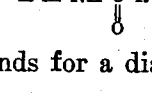
wherein X stands for a diazonium residue, Ar for an aryl residue substituted or not and R for alkyl, aryl or NH-aryl.

5. As new products, light-sensitive layers on a suitable base, containing compounds of the following formula:



wherein X stands for a diazonium residue, Ar for an aryl residue substituted or not and R for alkyl or aryl.

6. As new products, light-sensitive layers on a suitable base, containing compounds of the following formula:



wherein X stands for a diazonium residue,

Ar for an aryl residue substituted by oxalkyl groups and R for alkyl or aryl.

7. As new products, light-sensitive layers on a suitable base, containing compounds of the following formula:

$$X \cdot Ar \cdot NH \cdot \overset{\overset{O}{\|}}{C} \cdot R$$

wherein X stands for a diazonium residue, Ar for an aryl residue substituted by ethoxy groups and R for alkyl or aryl.

8. As new products, light-sensitive layers on a suitable base, containing the diazonium compound of 1-amino-2.5-diethoxy-4-benzoylaminobenzene.

In testimony whereof, we affix our signatures.

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