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LIGHT-SENSITIVE LAYER

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5 Claims. (Cl. 95—7)

The present invention relates to light-sensitive layers.

In the preparation of positive diazo-types from positive originals, light-sensitive layers are used, which contain a stable diazo compound and an azo component. Furthermore, positive diazo-types can be obtained by using light sensitive layers containing diazo compounds alone, and exposing them to light at first under a design and then for a short time in a free state, that is, without using a design (see U. S. Patent No. 1,444,469 to Gustav Kögel and Heinrich Neuenhaus dated February 6, 1923). However this process yields contingent results due to the double exposure to light.

We have now found that in a simple manner positive diazo-prints from positive originals are obtained by using diazo compounds which are stable in a neutral or an acid solution, but which in the presence of alkali are capable of coupling directly with themselves without being subjected to the action of light. These diazo compounds also possess the property of azo components. Among the compounds in question, those diazo compounds are particularly useful which contain one or several hydroxy- or amino groups, situated in a nucleus different from that containing the diazo group. Such diazo compounds are, for instance, produced from the amino-hydroxynaphthalenes such as 1-amino-8-hydroxynaphthalene-3-6-disulfonic acid (H-acid) 2-amino-5-hydroxynaphthalene-7-sulfonic acid (J-acid), or from amino-hydroxynaphthalenes having a diazotizable group attached to the nitrogen. It is, however, likewise possible to use diazo anhydrides, that is to say, aromatic diazo compounds, being substituted by at least one hydroxy- or amino group in ortho- or para-position to the diazo-group, and besides this containing at least one or more additional hydroxy- or amino groups preferably being attached to a nucleus different from that containing the diazo group. The diazo compounds may also have further substituents, such, for instance, as the methyl-, methoxy-, sulfo-, dimethyl-amino groups or the like. The hydroxy group may also be acylated, the acyl rest must, however, be easily saponifiable by means of an alkali. For example, the diazo compound may contain an O-CO-CH_3 group in the nucleus. The diazo compounds are applied on the base in an acid or neutral medium.

It is to be understood that the process may be carried out with all the various modifications practiced in the art of preparing diazo-types. Thus, for instance, a stabilizer or a metallic salt may be added to the layers.

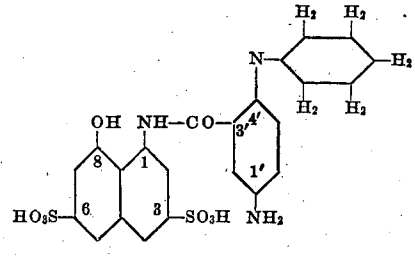
In the German Patent No. 111,416 to Marcel Schoen, dated April 13, 1899, there has already been described a process of obtaining from a positive picture a negative one or vice versa, by using a light sensitive layer containing a diazotized ortho-aminosalycylic acid which is applied on a base in an alkaline condition. Contrary thereto, according to the present process a positive is directly obtained from a positive. The diazosalycylic acid does not belong to the class of compounds claimed in our present application, because it is not capable of directly coupling with itself in an alkaline solution. But, by the action of light, the diazo-salycylic acid is transformed into a component capable of being coupled. Therefrom it follows that the process of the German Patent No. 111,416 above referred to consists in transforming by the action of light the diazo-salycylic acid partly into a component capable of being coupled. Due to the presence of the alkali, this component formed by the action of light immediately couples with the non-transformed diazo-salycylic acid whereby the picture is formed at the places which have been exposed to light.

The following examples illustrate our invention, but they are not intended to limit it thereto; the parts are by weight.

(1) 30 parts of diazotized H-acid are dissolved in 1000 parts of water with addition of 50 parts of tartaric acid and the solution is applied as usual on paper, films or the like.

After exposure to light under a positive and development in gaseous ammonia, reddish-violet positive copies are obtained. Copies prepared in the aforesaid manner can, of course, also be developed in alkaline solutions.

(2) A solution is prepared of 6 g of tartaric acid and 4 g of the diazo compound obtained in the usual manner from the 1'-amino-4'-piperidyl-3'-benzoyl-1- amino -8-hydroxynaphthalene-3.6-disulfonic acid in 150 cc. of water. The said amine of the formula:



is obtained in the following manner: 1-amino-8-hydroxy-naphthalene-3-6-disulfonic acid is condensed with 1-nitro-4-chloro-3-benzoylchloride; the condensation product is caused to react with piperidine and the nitro compound is reduced in the usual manner.

The solution is applied on a suitable base, for instance on paper or a film, and the base is dried. After exposure to light under a positive and development with gaseous ammonia, a bluish-violet picture is obtained.

(3) 3 g. of the double salt of zinc chloride and 2-diazo-7-hydroxynaphthalene and 4 g of tartaric acid are dissolved in 100 ccm of water. The solution is spread on a base. After drying, exposure to light under a positive and development with an alkali, a reddish picture is obtained.

By the term a diazo compound possessing also the property of an azo component, there is to be understood a compound which contains one or several NH_2 or OH groups having a free ortho- or para-position and wherein the OH groups may be acylated, but must be easily saponifiable by means of an alkali.

We claim:

1. Light-sensitive layers containing on a suitable base as single coloring matter an aromatic diazo compound which contains at least two benzene nuclei and in the benzene nucleus not containing the diazo group at least one free coupling position and is therefore capable of coupling with itself.

2. Light sensitive layers containing on a suitable base as single coloring matter an aromatic diazo compound which contains at least two benzene nuclei and in the benzene nucleus not containing the diazo group at least one hydroxyl group, which may be substituted and one free coupling position and is therefore capable of coupling with itself.

3. Light-sensitive layers containing on a suitable base as single coloring matter an aromatic diazo compound which contains at least two benzene nuclei and in the benzene nucleus not containing the diazo group at least one O-acyl group and one free coupling position and is therefore capable of coupling with itself.

4. Light-sensitive layers containing on a suitable base as single coloring matter an aromatic diazo compound which contains at least two benzene nuclei and in the benzene nucleus not containing the diazo group at least one $O.CO.CH_3$ group and one free coupling position and is therefore capable of coupling with itself.

5. Light-sensitive layers containing on a suitable base as single coloring matter an aromatic diazo compound which contains at least two benzene nuclei and in the benzene nucleus not containing the diazo group at least one amino group and one free coupling position and is therefore capable of coupling with itself.

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