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LIGHT-SENSITIVE DIAZOTYPE LAYERS AND METHOD OF MAKING SAME

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My invention relates to light-sensitive layers sensitized with a diazonium compound and to a method of making such layers.

The main object of my invention is to provide a simple, inexpensive and reliable method of preparing such layers.

Further objects will appear as the description progresses.

In accordance with the invention I form a light-sensitive layer on a support, by placing a diazonium compound in suspension in a solution of a water-insoluble binder dissolved in a volatile organic liquid, applying this dispersion to the support and volatilizing the solvent.

In one embodiment of the invention I suspend a coloring component, as well as the diazonium compound, in the solution. In such cases it is necessary to use combinations of diazonium compounds and coloring components which will not react prematurely even in the presence of the organic liquid and I prefer to use organic liquids which have no, or only a low affinity, for water. When the above precautions are taken there is much less danger of a premature reaction than when one uses a binder which is soluble in water, such as gelatine.

In carrying out the invention, I prefer to use a volatile organic liquid with which it is possible to produce a suspension that can readily be made homogeneous after the suspended material has settled during storage. Such suspensions can be made in known manner by grinding the material to be suspended with the suspension medium in a ball mill.

In spite of the fact that the binder of a sensitized diazo-layer produced by the method of the invention is insoluble in water, it is possible to produce readily the coloring material necessary for developing the image either in an aqueous medium or by means of a gas, such as ammonia, provided the layer is made in a suitable thickness.

It should be noted that using a thin layer of a binder has the advantage that sharper contrasts and better-defined images are obtained and that to obtain a concentration desirable for the obtaining of sharp contrasts, one is not limited to the solubility of diazonium compounds and of coloring components, because the use of a suspension according to the invention allows concentration variations within wide limits.

The method according to the invention has the advantage that it can be carried out in a simple manner, and it is well adapted for use with supports of substantially waterproof material.

In order that the invention may be clearly understood and readily carried into effect I shall describe the same in more detail with reference to several examples.

Example I

I form a suspension by placing 1 gm. of the $ZnCl_2$ -double salt of p-diethylaminobenzenediazonium chloride in its finely-divided state and 0.6 gm. of finely-divided phloroglucine in suspension in 100 cc. of carbon tetrachloride in which 5 gms. of cellodammar resin is dissolved. A layer of this suspension is applied to the surface of an aluminium support which is then introduced into a furnace heated to about 80° C. The plate is moved to and fro while the solvent is partly evaporated whereupon the excess suspension is poured off. Finally the solvent is completely removed by evaporation. An image can now be obtained on the sensitized layer so-formed by exposing the same until the diazonium compound at the exposed portions thereof has been completely decomposed and then developing the images by means of gaseous or aqueous ammonia. The resulting black image has a dull appearance which can be made gleaming by spraying the surface with a solution of carbon tetrachloride containing 5% cellodammar resin and then removing the carbon tetrachloride by vaporization.

If desired, I may add to the above suspensions a quantity of acid, such as tartaric acid, oxalic acid or the like in order to avoid the premature production of coloring material.

Example II

I form a suspension by placing 4 gms. of finely-divided $ZnCl_2$ and $CdCl_2$ -double salts of p-benzyl ethyl amino benzene diazonium chloride in suspension in 100 ccs. of trichlorethylene in which 5 gms. of cellodammar resin is dissolved. This suspension is applied to the surface of an aluminium plate and the solvent is removed similarly to Example I.

After exposure according to Example I, the image is developed by treating the layer with a solution of 0.5 gm. of phloroglucin in 100 ccs. of diluted aqueous ammonia whereby a bluish black colored positive image is obtained.

It should be noted that the invention extends to cases in which a coloring component is not placed in suspension but is dissolved in an organic volatile liquid, such as a solution of β -naphthol in benzene. In general, however, the results obtained in this way are inferior to those ob-

tained in the forms of execution described so that the latter are preferably used.

It is generally desirable to coat the finished images with a layer of transparent material, for instance a layer of Celluloid lacquer, in order to protect them against mechanical damage.

In the above examples, the plate or support, instead of being of aluminium, may be of other metals which preferably are not appreciably attacked by the materials to be used for instance silver, silver-plated metals and stainless steel. The support may also consist of materials such as glass, acetyl cellulose, rubber, rubber derivatives, such as the product known under the registered trade-mark "Pliofilm" which is extremely waterproof, paper, or the like.

In addition to binders mentioned above, such as cello-damar resin, I may use binders consisting of materials or mixtures of materials such as polymerised hydrocarbons, e. g., polystyrol, polymerised esters of unsaturated fatty acid derived for instance, from acrylic acid and its homologues, vinyl acetic acid or the like, artificial and natural resins and various types of gums, such as ester gum, mastic and colophony.

As other organic volatile solvents in which the said binders are easily soluble as a rule and which may be used for carrying out the invention, I may mention chlorinated hydrocarbons such as trichlorethylene and carbon tetrachloride and in addition materials such as benzene, toluene or the like.

Although I have described my invention with reference to specific examples and applications I do not desire to be limited thereto because obvious modifications will present themselves to one skilled in this art.

What I claim is:

1. In the manufacture of light-sensitive diazotype material, the steps of applying to the surface of a support a suspension of a diazonium compound in a solution of a water-insoluble binder in a volatile organic liquid in which the diazonium compound is insoluble, and volatilizing the organic liquid.

2. In the manufacture of light-sensitive diazotype material, the steps of applying to the surface of a support a suspension of a diazonium compound and a coloring component in a solution of a water-insoluble binder in a volatile organic liquid in which the diazonium compound is insoluble, and volatilizing the organic liquid.

3. In the manufacture of light-sensitive diazotype material, the steps of applying to the surface of a support a suspension of a diazonium compound in a solution of a water-insoluble binder in a volatile organic liquid having substantially no affinity for water and in which the diazonium compound is insoluble, and removing the organic liquid by volatilization.

4. In the manufacture of light-sensitive diazotype material, the steps of applying to the surface of a support of substantially waterproof material a suspension of a diazonium compound in a solution of a water-insoluble binder in a volatile organic liquid in which the diazonium compound is insoluble, and volatilizing the organic liquid.

5. A diazotype light-sensitive material made by the method of claim 1.

6. A diazotype light-sensitive material made by the method of claim 2.

7. A diazotype light-sensitive material made by the method of claim 4.

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