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PRODUCTION OF PHOTOSENSITIVE EMULSIONS

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The present invention relates to the production of photosensitive emulsions.

Hitherto chiefly gelatine and collodion have been employed in the manufacture of photosensitive emulsions as binding agents for substances which are sensitive to light, particularly silver halides. Agar has also been proposed for this purpose. To these binding agents however there are various objections, for example, they are very sensitive to heat, so that in their preparation as well as in their employment a drying by heat must be very restrained. Moreover the stability of the gelatine or agar emulsions is very limited owing to the destructive action of micro-organisms or of hot water.

We have now found that these objections are avoided by substituting water-insoluble salts of vegetable acids which form jellies with water, for the binding agents hitherto employed, such as gelatine or collodion. The salts of the polymers of aldehyde carboxylic acids, for example glucuronic or galacturonic acids, such as are obtained, for example, from the alkaline extracts of algæ or of other materials containing pectins, if necessary after purification, by precipitation with solutions of metal salts, are very suitable for the purposes of this invention. The salts of the alkaline earth metals, for example the calcium salts, are particularly suitable, because they yield clear transparent jellies having great adhesive strength on glass and paper substrata, other metal salts being less suitable for photographic purposes, since several are slightly colored and others do not give very strong and adherent layers. If desired the aforesaid salts may be employed also in conjunction with some albumen, such as gelatine, lysalbin or the like.

The advantage of these jellies lies in the fact that high temperature can be employed for drying emulsions prepared therewith and that the finished layers are very resistant to warm water, which properties are particularly valuable in a hot climate. They are also extremely well suited for the preparation of lantern plates, in which a great power for resisting the heat radiation from the projection lamp is to be desired. Moreover the films or emulsions have an extraordinary capacity for resisting attack by micro-organisms, for example mould fungi.

The photosensitive layers can be prepared for example by adding a solution of silver nitrate in aqueous ammonia to an aqueous solution of the ammonium salt of polyglucuronic acid pouring the solution onto a desired substratum and treating the whole with a solution of calcium chloride whereby a layer containing silver chloride and the calcium salt of polyglucuronic acid is formed. If desired the emulsions may already be prepared in the initial solution by adding thereto ammonium chloride, poured onto the desired substratum and then treated with a solution of a water-soluble calcium salt. Instead of the aforesaid silver salts other photosensitive metal compounds may be employed.

It is preferable to add small quantities of glycerol, in addition to the usual additions, such as are used in photography for sensitizing the photosensitive layer, since in this manner the flexibility and the adhesive power to the substratum chosen are increased.

The layers according to the present invention may find useful application in the manufacture of photographic plates or films or of photographic papers, such as the printing out, gas light or bromide papers and for the manufacture of papers employed in bromoil and the like processes.

The following examples will further illustrate the nature of the invention, but the invention is not restricted to these examples.

Example 1

100 cubic centimetres of a solution obtainable by extracting brown algæ with dilute ammonia solution, treating the solution with dilute sulphuric acid, bleaching the precipitated product with chlorine dioxide and redissolving in the least possible quantity of dilute ammonia solution, are treated with about 5 grams of silver nitrate, which are dissolved in concentrated ammonia. The solution thus obtained is applied in a thin layer to baryta paper. The paper treated in this manner is then immersed for a short time

in an approximately 15 to 20 per cent solution of calcium chloride which contains 25 per cent of glycerol washed with distilled water and dried at a temperature of from about 50° to 60° C.

Example 2

20 cubic centimetres of a solution of an algæ extract, prepared and purified as described in Example 1, are treated with an ammoniacal solution containing 1.8 grams of silver nitrate and 0.06 gram of ammonium chloride, and applied in a thin layer to baryta paper. The paper treated in this manner is passed into a precipitating bath containing 30 grams of calcium nitrate dissolved in water, 50 cubic centimetres of glycerol and 50 cubic centimetres of dilute acetic acid, kept immersed for a short period of time, washed with distilled water and dried at a temperature of from about 50° to 60° C.

What we claim is:—

1. A process for the production of photosensitive emulsions which comprises incorporating a photosensitive metal compound with a water-insoluble metal salt of a vegetable polymer aldehyde carboxylic acid.

2. A process for the production of photosensitive emulsions which comprises preparing a solution of water-soluble salt of a vegetable polymer aldehyde carboxylic acid, and a photosensitive metal compound, and treating it with a water-soluble salt of an alkaline earth metal.

3. A process for the production of photosensitive emulsions which comprises preparing a solution of water-soluble salt of a vegetable ploymer aldehyde carboxylic acid, and a compound of a metal the halogen compounds of which are photosensitive, adding an alkali metal salt of a hydro-halic acid, pouring the emulsion and treating it with a water-soluble salt of an alkaline earth metal and a hydro-halic acid.

4. A process for the production of photosensitive emulsions which comprises incorporating a photosensitive silver compound with a water-insoluble metal salt of a vegetable polymer aldehyde carboxylic acid.

5. A process for the production of photosensitive emulsions which comprises preparing a solution of a water-soluble salt of a vegetable polymer aldehyde carboxylic acid and a photosensitive silver compound, and treating it with a water-soluble salt of an alkaline earth metal.

6. A process for the production of photosensitive emulsions which comprises preparing a solution of a water-soluble salt of a vegetable polymer aldehyde carboxylic acid and a water-soluble compound of silver, adding an alkali metal salt of a hydro-halic acid, pouring the emulsion and treating it with a water-soluble salt of an alkaline earth metal and a hydro-halic acid.

7. As new articles of manufacture photosenstive emulsions the binding agent of which comprises a water-insoluble metal salt of a vegetable polymer aldehyde carboxylic acid.

8. As new articles of manufacture photosensitive emulsions the binding agent of which comprises a water-insoluble metal salt of a polymer glucuronic acid.

9. As new articles of manufacture photosensitive emulsions the binding agent of which comprises an alkaline earth metal salt of a vegetable polymer aldehyde carboxylic acid.

10. As new articles of manufacture photosensitive emulsions the binding agent of which comprises an alkaline earth metal salt of a polymer glucuronic acid.

11. As new articles of manufacture photosensitive emulsions the binding agent of which comprises a calcium salt of a vegetable polymer aldehyde carboxylic acid.

12. As new articles of manufacture photosensitive emulsions the binding agent of which comprises a calcium salt of a polymer glucuronic acid.

13. As new articles of manufacture photosensitive emulsions the binding agent of which consists of an alkaline earth metal salt of a vegetable polymer aldehyde carboxylic acid.

14. As new articles of manufacture photosensitive emulsions the binding agent of which consists of an alkaline earth metal salt of a polymer glucuronic acid.

15. As new articles of manufacture photosensitive emulsions the binding agent of which consists of a calcium salt of a vegetable polymer aldehyde carboxylic acid.

16. As new articles of manufacture photosensitive emulsions the binding agent of which consists of a calcium salt of a polymer glucuronic acid.

In testimony whereof we have hereunto set our hands.

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