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PROCESS OF PRODUCING LIGHT-SENSITIVE SYSTEMS

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4 Claims. (Cl. 95—7)

The present invention relates to a process of producing light-sensitive systems, and particularly is directed to improvements in the light-sensitive substances, which are obtained by the process of my U. S. application, Ser. No. 306,896, filed Nov. 30, 1939.

The light-sensitive substances described in my prior application are produced by the introduction of alien sensitizing substances into metal halides, for example silver sulfide into silver halide or into mixtures of them, in such a manner, and heating the mixture to a temperature at which said alien substance is incorporated into the silver halide by fusion, and in which the halogen liberated by disscciation during the heating, is removed.

According to the process of my above named prior application there may be produced light-sensitive systems of silver chloride and silver bromide, or of mixtures of them, by sensitizing them with silver sulfide. These light-sensitive systems may then be mixed with suitable colloids, such as gelatine and the like, to prepare photographic emulsions.

I have found, that new-light-sensitive systems may be obtained by introducing the iodide of silver into the described light-sensitive systems of silver chloride or silver bromide, or of their mixtures.

These new light-sensitive systems excel the systems, produced according to my prior application Ser. No. 306,896, in the possibility of varying and regulating their photographic and other properties in a high degree.

So their sensibility, their stability, the stability of the photographic emulsions, prepared from them, the characteristics of the photographic images, obtained by using them, may be influenced and regulated in a high extent.

The process of the present invention may be accomplished for example in the following manner.

The light-sensitive systems of silver chloride or silver bromide, sensitized by silver sulfide, or mixtures of them are molten. The iodide of silver is added to the molten mass and uniformly distributed in the same. Then the mass, now containing the iodide of silver, is cooled, and after cooling, is treated by heating at temperatures not exceeding 150° C. This heating results in a substantial increase in the light sensitiveness of the systems.

The process of the present invention may be varied. It is possible, for instance, to add the iodide of silver to the other silver halides before the sensitizing alien substances are introduced into them, or in any other stage of the preparation of the light-sensitive systems. Furthermore the light-sensitive systems, containing the silver iodide, may be obtained in a state of a fine powder by atomizing the systems when molten, for example, with the aid of atomizing gases and/or vapours as described in my copending application Serial No. 338,639, filed June 3, 1940 or in any other convenient manner.

The properties of the products of the invention may be further influenced by an oxidizing treatment. This oxidizing treatment may be carried out in different ways and by using different oxidizing substances, e. g. oxygen, if desired at high temperatures and at high pressures. Furthermore the above described atomization of the light-sensitive systems may be effected by oxidizing gases or vapours.

The light-sensitive products, produced in accordance with the process of the present invention, may be employed without binding substances by cementing the same to suitable supports.

Furthermore they may be introduced into colloids, serving as binding agents or carriers. Hereby emulsions are prepared, which are similar to the photographic emulsions. These mixtures of the light-sensitive products and the colloids may be poured as sheets, foils or the like, or may be applied on suitable supports.

The introduction of the light-sensitive systems into the colloids is done by carefully mixing them, e. g., by strongly stirring them. by treating them by vibrations, and/or by using the distributing, dispersing and wetting agents and processes which are known in colloidal chemistry.

The pouring of the emulsions of the light-sensitive substances and colloids in sheets or on supports may be effected by the usual methods of making photographic plates, films, papers and the like. The emulsions may be applied on one side of the support or both. They may be poured in one layer or more. Here, the usual measures in the manufacture of photographic plates, films, papers and the like are to be provided for, such as back-, adhering-, anti-halo-, filtering-, intermediary-, protecting- and covering layers. Also, optical photographic sensitizers and dyestuffs for coloring the layers may be added to the emulsions or incorporated in the layers, e. g., by bathing them in the solutions of the dyestuffs.

Colloids that may be used for the manufacture of the emulsions of the light-sensitive systems, are the different species of gelatine, among

them also the so called "inert" gelatine, albumins and other proteins, collodion, cellulosic esters and ethers, natural and artificial resins and polymerisates, and the like.

As supports for the emulsions of the light-sensitive systems and the colloids, there may be used plates of glass, films of cellulose, collodion, cellulosic derivatives, e. g., cellulosic esters or cellulosic ethers, of resins or polymerisates, sheets of metals, paper and the like.

The pouring of the light-sensitive emulsions may be effected according to the methods known in the photographic industry for the production of photographic films, plates, and papers.

What I claim is:

1. In a method of producing light sensitive systems of silver halides, in which a mixture of silver halide and an alien substance acting as a sensitizer is heated to a temperature at which said alien substance is incorporated into said silver halide by fusion and in which the halogen liberated by dissociation during the heating is removed and the resulting product is cooled, the steps of incorporating silver iodide into the molten mass before cooling the same, and subjecting the cooled mass to a heat treatment at a temperature not exceeding 150° C.

2. In a method of producing light sensitive systems of silver halides, in which a mixture of silver halide and an alien substance acting as a sensitizer is heated to a temperature at which said alien substance is incorporated into said silver halide by fusion and in which the halogen liberated by dissociation during the heating is removed and the resulting product is cooled, the steps of incorporating silver iodide into the silver halide, and after the cooling step reheating the resulting product, which now contains silver iodide, to a temperature not exceeding 150° C.

3. In a method of producing light sensitive systems of silver halides, in which a mixture of silver bromide and silver sulfide is heated to a temperature at which said silver sulfide is incorporated into said silver bromide by fusion and in which the bromide liberated by dissociation during the heating is removed and the resulting product is cooled, the steps of incorporating silver iodide into the molten mass before cooling the same, and reheating the cooled mass after the cooling step to a temperature not exceeding 150° C.

4. In a method of producing light sensitive systems of silver halides, in which a mixture of silver chloride and silver sulfide is heated to a temperature at which said silver sulfide is incorporated into said silver chloride by fusion and in which the chloride liberated by dissociation during the heating is removed and the resulting product is cooled, the steps of incorporating silver iodide into the molten mass before cooling the same, and reheating the cooled mass after the cooling step to a temperature not exceeding 150° C.

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