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2,887,381

SENSITIZED PHOTOGRAPHIC SUBSTANCES

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The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment of any royalty thereon.

The invention relates to new sensitized photographic substances and to photographic elements made with such substances.

It has been known that some of the silver salts of organic sulfinates are photosensitive and may be used to manufacture photographic elements. These photosensitive silver salts of organic sulfinates have however not attained practical importance because their photosensitivity does not compare favorably with the sensitivity of the conventional silver salts.

I now have found that silver p-toluene sulfinate and silver benzene sulfinate may be utilized to great advantage for the manufacture of photographic elements if they are used in combination with small amounts of surface active agents or wetting agents such as sodium lauryl sulphate, sodium 2-ethylhexene sulfonate, sodium tetradecyl sulfate, sodium dioctyl phosphate, sodium heptadecyl sulfate, polyethylene glycol alkyl ethers, octadecyl-tri-methyl ammonium chloride or dodecyl-tri-methyl-ammonium-chloride and similar surface active compounds.

The invention will become more apparent from the following description of specific embodiments of the broad inventive idea.

Example 1

1.00 gm. of silver p-toluene sulfinate is agitated with 5 ml. of gelatin (3% gelatin solution at 40° C.). After the silver salt is sufficiently dispersed an additional 10 ml. of the 3% gelatin solution is added. To this mixture 10 ml. of a 2% solution of sodium cetyl sulfate or sodium octyl sulfate in water is added whereupon the mixture is passed thru a stainless steel homogenizer (warmed). The homogenized dispersion is then used as a coating on clean glass slides and the slides are exposed to light and developed in the usual manner. The light sensitivity of these layers made according to the invention is increased about ten fold as against the light sensitivity of layers made without any surface active agents.

Example 2

1.00 gm. of silver benzene sulfinate is dispersed in 10 cc. of a 3% gelatin solution in the manner described in Example 1 and thereupon 10 cc. of a 2% solution of sodium lauryl sulfate in water is added. The mixture is passed thru a homogenizer and the dispersion is then coated on glass slides or paper. The light sensitivity of these layers is improved many times over the light sensitivity of such layers made without a wetting agent.

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Example 3

0.6 gm. of silver benzene sulfinate are dispersed in a mixture consisting of 10 gm. of a polyvinyl butyral solution (10% in ethyl alcohol) and 0.3 cc. of glycerine. To this mixture are added 2-4 cc. of octa-decyl-trimethyl-ammonium-chloride or dodecyl-trimethyl-ammonium-chloride (2% solution in alcohol) as wetting agent. The mixture is then treated as described above and coated on glass slides or paper.

Favorable results are generally obtained according to the invention if the surface active agents are present in amounts of between 0.2 to 2% of the weight of the finished photographic element. Two or more surface active agents may be mixed in varying proportions into the colloid carrier.

The mixture of the photosensitive substances and the wetting agents may be dispersed in any suitable colloid carrier to produce a modified photographic layer on one of the conventional supports. The material for the photographic layer may consist of gelatin, casein, agar or various natural or synthetic high polymers such as polystyrene or phenol formaldehyde resins, vinyl resins, alkyd resins, etc. The support for the new photosensitive layer may be a plate of any of the commonly used materials such as glass, paper, cellulose derivatives, etc.

It will be obvious to those skilled in the art that many variations and combinations of the photosensitive silver salts and the wetting agents are possible and that the invention is not limited to the specific wetting agents mentioned in the examples but can also be used in connection with other surface active or wetting agents which have the capacity of improving the light sensitivity of silver p-toluene sulfinate and silver benzene sulfinate.

What is claimed is:

1. A photographic element comprising an organic colloid carrier having dispersed therein a light sensitive silver salt selected from the group consisting of silver p-toluene sulfinate and silver benzene sulfinate and a surface active agent selected from the group of sodium lauryl sulphate, sodium 2-ethylhexene sulfonate, sodium tetradecyl sulfate, sodium dioctyl phosphate, sodium heptadecyl sulfate, polyethylene glycol alkyl ethers, octa-decyl-trimethyl-ammonium-chloride or dodecyl-trimethyl-ammonium-chloride, said surface-active agents are being present in amounts of between 0.2 and 2 percent of the weight of the finished photographic element.

2. A photographic element according to claim 1 in which the silver salt consists of silver p-toluene sulfinate.

3. A photographic element according to claim 1 in which the silver salt consists of silver benzene sulfinate.

4. A photographic element according to claim 1 in which the surface active agent consists of sodium lauryl sulphate.

5. A photographic element according to claim 1 in which the surface active agent consists of sodium 2-ethylhexene sulfonate.

6. A photographic element according to claim 1 in which the surface active agent consists of sodium tetradecyl sulfate.

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