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PHOTOSENSITIVE MATERIALS

Lawrence Suchow, New York, N. Y., assignor to the United States of America as represented by the Secretary of the Army

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8 Claims. (Cl. 95—7)

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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.

This invention relates to new photosensitive and phototropic materials and more particularly to solid state reaction products between silver sulfide and mercuric iodide that are sensitive to ultraviolet and visible light up to the respective reflectance edges.

The invention is based on the discovery that by heating in the solid state a finely ground mixture of silver sulfide and mercuric iodide at various mol ratios (from 2 to 70 mol per cent silver sulfide) and at temperatures of about 200° C. compositions are obtained the photosensitivity of which will depend on the mol ratio in which these two substances have been reacted.

The invention will become more apparent from the following descriptions of specific embodiments of the inventive idea:

Example 1.—Silver sulfide and mercuric iodide both in the solid state are finely ground together in a mortar using a molar ratio of 1:1. This mixture is filled into a Pyrex glass tube and the tube is then heat-sealed, preferably under vacuum. The sealed tube is then heated for about sixteen hours at 200° C. after which time a yellow photosensitive product is obtained which will turn brown to black in about 3 to 5 seconds in sunlight.

Example 2.—Silver sulfide and mercuric iodide are ground together in the solid state as in Example 1 but using a molar ratio of 3:2. This mixture is then treated in a Pyrex glass tube in the same manner as in Example 1. The end product is red and shows an extremely high photosensitivity, turning black in less than one second in sunlight.

The photosensitive products made according to the

present invention are phototropic in various degrees, that is, they revert to the original color on standing or heating and are therefore reusable.

With 30 mol per cent silver sulfide or less the new products are highly phototropic at room temperature; at all mol ratios (including those under 30 mol per cent) the original color may be restored rapidly by heating.

The new materials made according to the invention may be used for making reversible print-out papers for temporary reproduction of documents or photographs, for rapid viewing of negatives as positives, for recording information which is to be erased after a certain time and for all other purposes to which photosensitive and phototropic material may be put.

It will be understood by those skilled in the art that various changes and modifications in the method of making the new materials are feasible without departing from the inventive idea as defined in the following claims.

What is claimed is:

1. A method of producing a new photosensitive material comprising heating in the solid state an intimate mixture of finely ground silver sulfide and mercuric iodide until a photosensitive and phototropic material has been obtained that will turn brown to black in sunlight.

2. A method of producing a new photosensitive material according to claim 1 in which silver sulfide and mercuric iodide are reacted in a molar ratio of 1:1.

3. A method of producing a new photosensitive material according to claim 1 in which silver sulfide and mercuric iodide are reacted in a molar ratio of 3:2.

4. A method of producing a new photosensitive material according to claim 1 in which silver sulfide and mercuric iodide are reacted in a molar ratio of 1:4.

5. A method of producing a new photosensitive material according to claim 1 in which silver sulfide and mercuric iodide are reacted in a molar ratio of 1:9.

6. A method of producing a new photosensitive material according to claim 3 in which the solid state mixture of silver sulfide and mercuric iodide is heated for about sixteen hours at 200° C.

7. A new photosensitive and phototropic material made by the process of claim 1.

8. A new photosensitive and phototropic material made by the process of claim 2.

References Cited in the file of this patent

Wall: Intensification and Reduction, American Phot. Pub. Co., Boston, Mass., 1927 (page 20).