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ULTRA-VIOLET SENSITIVE LAYER

Samuel E. Sheppard and Leon W. Eberlin, Rochester, N. Y., assignors to Eastman Kodak Company, Rochester, N. Y., a corporation of New York

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5 Claims. (Cl. 95—7)

This invention relates to photo-sensitive layers, the sensitivity of which lies chiefly in the ultra-violet.

It is desirable for certain actinometric purposes to have a light sensitive material which reacts to the near ultra-violet rays, without being appreciably affected by the rest of the spectrum. Specifically, such a paper may be used to demonstrate or dose the ultra-violet radiation of sunlight and of various artificial light sources, particularly those used therapeutically. It is an object of this invention to produce such a paper, although it is understood that these materials may be coated on other supports and may be used for other purposes.

We have found that compounds of certain metals of the VIth group of the periodic table used in such coatings, particularly with an oxidizable substance, are sensitive to the ultra-violet and have very little sensitivity to the wave lengths greater than 4,000 Ångstrom units. These metals are molybdenum, tellurium, and tungsten. Of these, molybdenum and tungsten are particularly useful.

If compounds of these metals, such as sodium tungstate or sodium molybdate are made up into a coating mixture with an oxidizable substance, such as glucose or dextrose, a layer will be obtained which will give a visible image in a short time when exposed to ultra-violet light.

The general reaction on which this result is based may be represented as

$$QO_3 + \text{light} = QO_2 + O$$

In this reaction Q represents a metal ion, and O oxygen. In these reactions the liberated oxygen is used to oxidize the added substance such as glucose or dextrose.

Specific examples of our invention are the following:

Example I

Sodium tungstate	10 grams
Dextrose	10 grams
Water	1000 c. c.

To this sufficient hydrochloric acid to make definitely acid is added. About 20 c. c. of 35% hydrochloric acid is sufficient.

This composition may be coated on a paper or other support, or the paper may be floated upon it and then withdrawn and dried.

Another suitable coating composition is

Example II

Sodium molybdate	10 grams
Dextrose	10 grams
Water	1000 c. c.
To which is added	
Citric acid	20 grams

For a gelatine coating, which is more desirable for certain purposes, the following composition is suitable:

Example III

Sodium tungstate	12 grams
Dextrose	12 grams
Water	150 c. c.
Hydrochloric acid 35%	24 c. c.

The acidified tungstate solution is then added to 150 c. c. of 10% gelatine. The solution may be coated on photographic paper or other support by any known method.

Any of the above compositions when coated on paper and exposed to ultra-violet light will show a positive color change from white to blue. The maximum sensitivity of the tungsten compound has been found to lie in the region of 3,500 Ångstrom units while that of molybdenum is nearer 4,000 Ångstrom units. These coatings have very little sensitivity in the visible spectrum beyond 4,000 Ångstrom units.

We contemplate as included within our invention all variations and equivalents coming within the scope of the appended claims.

What we claim is:

1. A photo-sensitive layer sensitive primarily to the ultra-violet comprising an oxygen-containing compound of a metal of the VIth group of the periodic table having an atomic weight between 90 and 200, and dextrose.

2. An actinometric paper sensitive primarily to the ultra-violet comprising a support and a coating containing sodium molybdate and dextrose.

3. An actinometric paper sensitive primarily to the ultra-violet comprising a support and a coating containing sodium tungstate and dextrose.

4. The method of making a photo-sensitive layer sensitive primarily to the ultra-violet which comprises coating a suitable support with a mixture containing sodium molybdate and dextrose.

5. The method of making a photo-sensitive layer sensitive primarily to the ultra-violet which comprises coating a suitable support with a mixture containing sodium tungstate and dextrose.

SAMUEL E. SHEPPARD.
LEON W. EBERLIN.