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THIOSALICYLIC ACID ANTIFOGGANT

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FIG. 1.

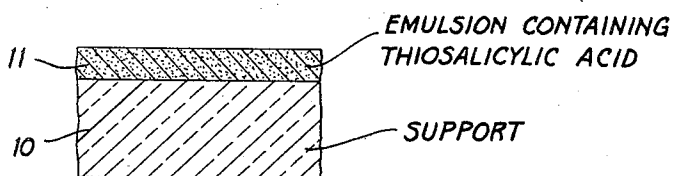


FIG. 2.

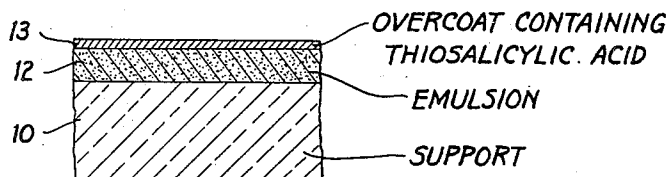
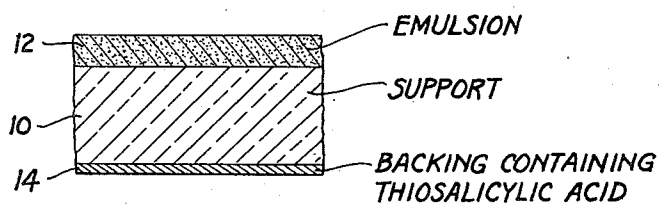


FIG. 3.



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## UNITED STATES PATENT OFFICE

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## THIOSALICYLIC ACID ANTIFOGGANT

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7 Claims. (Cl. 95-7)

This invention relates to photography and particularly to a method of preventing fog in photographic silver halide emulsions.

One of the problems met in the development of photographic emulsions for protracted periods of time or at higher temperatures than normal is that of fog. A more or less uniform veil of silver, which is known as fog, is produced in the emulsion when the limits of time and temperature of development are exceeded.

It is, therefore, an object of the present invention to provide a method for reducing fog in photographic emulsions. A further object is to provide a photographic emulsion containing a novel fog inhibiting agent. A still further object is to provide a photographic developing solution which has decreased tendency to produce fog in a photographic emulsion. Other objects will appear from the following description of my invention.

These objects are accomplished, according to my invention, by incorporating thiosalicylic acid in a photographic emulsion, developer, backing or overcoating layer.

In the accompanying drawing, Fig. 1 is a sectional view of a photographic film having an emulsion layer containing thiosalicylic acid, Fig. 2 is a sectional view of a film having an overcoating layer containing thiosalicylic acid and Fig. 3 is a sectional view of a film having a backing layer containing thiosalicylic acid.

When used in the developing solution, the thiosalicylic acid may be employed as the free acid or as the sodium salt or other water-soluble salt. The amounts used may vary from .01 gram to 1 gram per liter of developer. The compounds may also be used in a prebath prior to development.

When used in the emulsion itself, the thiosalicylic acid may also be employed in the salt form and may be incorporated at any stage in the manufacture of the emulsion. The amounts used in the emulsion vary from 0.2 mg. to 20 mgs. per 50 grams of silver halide.

My invention will be further illustrated by reference to the following examples:

## Example 1

The following example illustrates a developing solution containing thiosalicylic acid.

Monomethyl-p-aminophenol sulfite	grams	2.2
Hydroquinone	do	8.8
Sodium sulfite (desiccated)	do	72
Sodium carbonate (desiccated)	do	48
Potassium bromide	do	4
Thiosalicylic acid	do	.01
Water to	liter	1

## Example 2

The following example illustrates a developing formula which produces high contrast:

Hydroquinone	grams	15
Sodium sulfite (desiccated)	do	75
Sodium carbonate (desiccated)	do	50
Potassium bromide	do	10
Thiosalicylic acid	do	0.1
Water to	liter	1

## Example 3

The following example illustrates the incorporation of thiosalicylic acid in the emulsion:

To the liquid emulsion as prepared for coating is added an aqueous solution of the sodium salt of thiosalicylic acid in such amount that the emulsion will contain approximately 0.2 mg. to 20 mgs. per 50 grams of silver halide.

The use of my agents in an overcoating or backing layer is also advantageous since it avoids incorporation of the agent in the emulsion and therefore avoids the tendency to produce variations in the sensitometric characteristics of the emulsion. When thiosalicylic acid is applied in a gelatin layer over a silver halide emulsion layer, for example, the rate of growth of fog with development time may be reduced without substantially changing the sensitometric curve shape or the maximum density of the emulsion.

The thiosalicylic acid may be used alone as an antifoggant or it may be combined with another antifoggant which may be present either in the same layer as the thiosalicylic acid or in an adjacent layer.

In the accompanying drawing I have shown in Fig. 1 a sectional view of a photographic film comprising a support 10 of any suitable material such as glass, cellulose ester, synthetic resin or paper, having thereon an emulsion layer 11 containing thiosalicylic acid. Fig. 2 shows a similar material in which the support 10 has thereon a gelatino-silver halide emulsion layer 12 which is overcoated with a gelatin layer 13 containing thiosalicylic acid. Fig. 3 illustrates a further modification in which the support 10 is coated with an emulsion layer 12 and the opposite side of the support 10 has thereon a gelatin backing layer 14 containing thiosalicylic acid. The thiosalicylic acid present in a backing layer is dissolved in the developer upon development and exerts its antifoggant action during development.

It will be understood that the examples and modifications included herein are illustrative only and that my invention is to be taken as limited only by the scope of the appended claims.

I claim:

1. The method of reducing fog in a photographic silver halide emulsion, which comprises exposing said emulsion and developing it in the

presence of a fog-inhibiting amount of thiosalicylic acid.

2. A gelatino-silver halide emulsion containing a fog-inhibiting amount of thiosalicylic acid.

3. A gelatino-silver halide developing-out emulsion containing a fog-inhibiting amount of thiosalicylic acid.

4. A gelatino-silver halide developing-out emulsion containing from 0.2 to 20 milligrams per 50 grams of silver halide of thiosalicylic acid.

5. A photographic developing solution com-

prising a silver halide developing agent and a fog-inhibiting amount of thiosalicylic acid.

6. A photographic element comprising a support having thereon a silver halide emulsion layer and another layer containing a fog-inhibiting amount of thiosalicylic acid.

7. A photographic element comprising a support having thereon a silver halide emulsion layer and a gelatin overcoating layer containing a fog-inhibiting amount of thiosalicylic acid.

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