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PHOTOGRAPHIC DEVELOPER CONTAINING DISODIUM SALTS OF MONOHYDRIC PHENOL MONOACIDS

Frederic R. Bean, Rochester, N. Y., assignor to Eastman Kodak Company, Rochester, N. Y., a corporation of New Jersey

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3 Claims. (Cl. 95—88)

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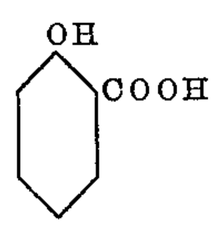
This invention relates to photographic developers, and more particularly to developers in which the usual alkalies are replaced by compositions new for the purpose.

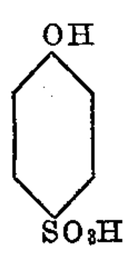
One object of my invention is to provide air-stable, moisture-resistant alkalies for use in photographic developers. Another object is to provide alkalies which will give, in photographic developers, approximately the same alkalinity as sodium hydroxide. Another object is to provide stable, non-caking, ready-mixed, dry developer powders. Other objects will hereinafter appear.

Alkaline developers have been known and used for many years. These developers usually contain developing agents, a so-called preservative, such as sodium sulfite, and an alkali. One of the oldest and most useful alkalies used in photographic developers is sodium hydroxide, otherwise known as caustic soda. The degree of alkality which it confers upon a developer has been found to be most suitable for certain purposes. However, sodium hydroxide is deliquescent and corrosive, and for this reason is difficult to handle, weight, store and package. Moreover, when used in ready-mixed, packaged developer powders, which, because of their convenience and uniformity, are very popular among both amateur and professional photographers, sodium hydroxide is apt to cause caking, discoloration, and deterioration of the powder.

I have discovered that the disodium salts of monohydric phenol monoacids in which the acid radical is selected from the group consisting of the carboxyl radical and the sulfo radical are suitable for use in photographic developers in which it is desired to have the alkaline properties of sodium hydroxide without its undesirable properties. Examples of the salts whose use as alkalies in developers comes within the scope of my invention are the disodium salts of the following compounds:



Salicylic acid



p-Phenolsulfonic acid

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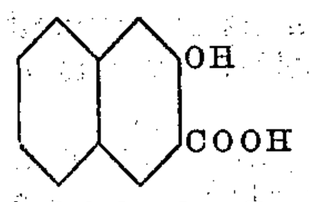
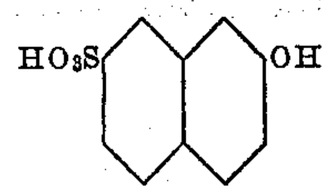
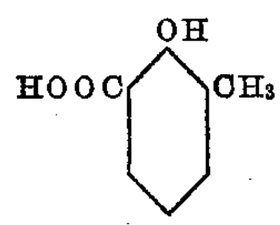


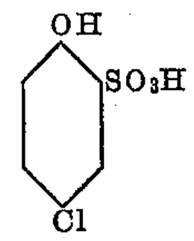
2, 3-naphthol carboxylic acid



2-naphthol-7-sulfonic acid



2, 3-cresotic acid (2-hydroxy-3-methyl benzoic acid)



4-chloro phenol 2-sulfonic acid

The disodium salt of any of these acids, in aqueous solution, gives practically the same pH as an equimolecular concentration of sodium hydroxide.

When a disodium salt of a monohydric phenol monocarboxylic acid is used as an alkali in a developer solution, the activity of the developer is the same as when an equimolecular weight of sodium hydroxide is used. However, when a disodium salt of a monohydric phenol monosulfonic acid is used, the developer does not have the activity it would have if an equimolecular weight of sodium hydroxide were used. The sodium sulfonate group markedly restrains development.

The disodium salts of the monohydric phenol monocarboxylic and monosulfonic acids are non-hygroscopic solids, stable to the atmosphere, convenient to package and handle. They can be mixed directly with the sodium sulfite of the developer for packaging. When they are dissolved in water, the phenate group hydrolyzes. The sodium carboxylate or sodium sulfonate group is very little hydrolyzed. The sodium carboxylate or sodium sulfonate group causes the phenolic compound resulting from the hydrolysis to remain in solution.

As illustrative examples of developers embodying my invention, I give the following:

Example 1

	Grams
Hydroquinone	6.0
p-Methylamino-phenol sulfate	1.5
Sodium sulfite	20.0
Disodium salicylate	20.0
Potassium bromide	1.0

For use dissolve in 300 ml. of water.

Example 2

	Grams
Hydroquinone	6.0
p-Methylamino-phenol sulfate	1.5
Sodium sulfite	20.0
Disodium p-phenol sulfonate	26.0
Potassium bromide	1.0

For use dissolve in 300 ml. of water.

What I claim as my invention and desire to be secured by Letters Patent of the United States is:

1. A photographic developer, in dry form, containing a developing agent and, as an alkali, a disodium salt of a monohydric phenol monoacid selected from the group consisting of salicylic acid, p-phenolsulfonic acid, 2,3-naphthol carboxylic acid, 2-naphthol-7-sulfonic acid, 2,3-cresotic acid (2-hydroxy-3-methyl benzoic acid), and 4-chloro phenol 2-sulfonic acid.

2. A photographic developer, in dry form, containing a developing agent and, as an alkali, disodium salicylate.

3. A photographic developer, in dry form, containing a developing agent and, as an alkali, disodium p-phenolsulfonate.

FREDERIC R. BEAN.

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The following references are of record in the file of this patent:

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