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COMPOSITIONS AND PROCESSES FOR THE DEVELOPMENT OF SILVER HALIDE ELEMENTS

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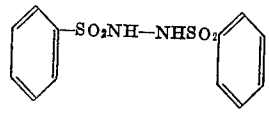
No Drawing. Application July 10, 1952, Serial No. 298,179

2 Claims. (Cl. 95—88)

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This invention relates to photography and more particularly to compositions and processes for the development of photosensitive silver halide elements.

It is one object of the present invention to provide processes and compositions for the development of silver halide emulsions in which the developing agent is an organic aromatic compound having oxidation products which produce no adverse staining effect upon the silver halide emulsion so developed. Specifically, the organic compound comprehended by the present invention as a silver halide developer is bis-benzene-sulfonyl hydrazide which may be synthesized according to the procedures disclosed in Ber. 27, 601, (1894) and Ber. 34, 3160 (1901). Bis-benzene-sulfonyl hydrazide is a compound having a melting point of 234° to 235° C., which precipicates as white needles and is insoluble in water, slightly soluble in alcohol and soluble in alkali. It has the following chemical configuration:



It has been determined that bis-benzene-sulfonyl hydrazide is exceptionally effective as a selective developer for silver halide emulsions especially as compared to the derivatives of hydrazine which have heretofore been proposed for use as developing agents and, as an organic aromatic developer, possesses the very significant property of given oxidation products which are relatively color free and have no appreciable adverse effect upon the stability of the silver print in which they are contained. As a result, this novel developing agent is especially useful in photographic processes which are intended to eliminate any washing or stabilizing operations in liquid baths subsequent to the formation of the silver print. Examples of such processes are disclosed in the copending application of Edwin H. Land, Serial No. 7,795, filed February 12, 1948, now Patent No. 2,647,056, for Photographic Process. The utility of the developer of the invention is, however, by no means limited to such processes and the developing agent may be satisfactorily employed in conventional multistage and multibath photographic processing procedures either in black-and-white or color photography.

One example of a novel developer composition formed in accordance with the present invention and set out by way of illustration only is the following:

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Example

Sodium hydroxide	grams	5
Bis-benzene-sulfonyl hydrazide	do	5
Water	cc	100

The developer composition is formed by first dissolving the sodium hydroxide in the water and then adding the bis-benzene-sulfonyl hydrazide to this basic solution. A developer composition so constituted fully develops a latent image formed in a fast negative film (Kodak Super XX Pan) and in an orthochromatic, low-speed, high contrast process film (Kodak CPO) in about ten seconds.

The bis-benzene-sulfonyl hydrazide possesses excellent selectivity as a developer and the silver print produced by the developer has no tendency to stain by virtue of the residual reaction products of the development which may be contained therein. A black silver deposit is given by the development and the print is relatively fog free.

As noted hereinabove, bis-benzene-sulfonyl hydrazide is especially useful in transfer processes of the type disclosed in the said application Serial No. 7,795 and in other processes in which the problem of a residual stain cannot be readily met by washing operations. When used for transfer purposes, the novel developer composition hereinabove set out has incorporated therein as a further ingredient a silver halide solvent such as sodium thiosulfate. If the composition is to be applied to the emulsion by being spread thereon in a thin layer, it may also include a film-forming thickening agent such, for example, as the high molecular weight polymer, sodium carboxymethyl cellulose.

Since certain changes may be made in the above product and process without departing from the scope of the invention herein involved, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. As a new developer composition for the formation of silver transfer prints, an aqueous solution comprising an alkali, a silver halide solvent fixer and bis-benzene-sulfonyl hydrazide.

2. The process of developing a latent image in a silver halide emulsion which comprises treating said emulsion with an alkaline aqueous solution of bis-benzene-sulfonyl hydrazide.

References Cited in the file of this patent

Ber. Deut. Chem., vol. 27, pages 601–602 (1894), vol. 34, page 3160 (1901).