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2,882,152

HIGH SPEED DEVELOPERS

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2 Claims. (Cl. 96-66)

The present invention relates generally to photographic developers and, as illustrated herein, more particularly to accelerators for photographic developers.

In the measurement of emulsion speed of a photographically sensitized material two factors are taken into account. The exposure to which the material is subjected in terms of meter-candle-seconds and the maximum density obtainable by development of the film. The manner in which the film material is developed and the formula of the developer bath are relevant factors in the attainment of maximum density of a given film material bearing a stated exposure. If two samples of the same film material received identical exposures and one is processed in a mildly energetic developer and the other is developed in a high energy developer to a gamma equivalent to that of the first, it may be said in general that the second case will result in a higher emulsion speed than that of the first case.

The present invention contemplates the provision of an additive for increasing developer potential of conventional as well as high speed photographic developers by adding to the developer bath 0.5 to 5.0 milliliters of the following mixture per liter of developer formula:

Hydrazine	10	G.
Triethanolamine	90	

The present mixture is particularly applicable for use with metol-hydroquinone developers. It may also be used with rapid photographic processing developers containing 2,4-diaminophenol hydrochloride if, at the same time, a suitable quantity of anti-foggant is added.

It is difficult, under some conditions, to provide negatives which are exposed sufficiently to attain maximum density by the use of conventional developers without fogging. Night photography, of necessity, is conducted under adverse and variable light conditions, and useful high information negatives of good contrast are essential to permit maximum military use to be made of such negatives. Accelerators or additives heretofore used for this purpose are acidic in solution, thus lowering the pH concentration and increasing the processing time.

The present mixture is added to a conventional developer solution in such small quantities that any appreciable reduction in processing time would not be expected, but it has been found that addition of small amounts ranging from 0.5 to 5.0 milliliters of the mixture does appreciably reduce the processing time without loss of contrast and with an image having a grain comparable to that obtainable by the use of conventional photographic developers.

The mixture disclosed above may be used in connection with a developer containing both metol and hydroquinone as follows:

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Example 1

	G.
Monomethyl-p-aminophenol (metol)	2
Sodium sulphite (desiccated)	100
Hydroquinone	5
Borax	0.5

Water to make 1 liter.

Add 0.5 to 5.0 milliliters of the above mixture of 10 g. hydrazine and 90 g. of triethanolamine.

This developer is used without dilution at a temperature of 65° F. Average processing time under these conditions will run from 30 to 60 seconds as compared with an average of 5 to 20 minutes with a conventional type of pyro-amidol developer.

Water	cc--	1000
Sodium sulphite	g--	12.6
Pyrogallol	g--	25.2
2,4-diaminophenol hydrochloride	g--	2.0
Sodium carbonate (monohydrated)	g--	49.6
Potassium bromide	g--	3.0

The hydrazine-triethanolamine additive may be used in conjunction with the pyro-amidol developer if a suitable anti-foggant such as potassium bromide, is used in the developer disclosed above.

It is to be understood that the present invention is not limited to the formulae and examples cited above, but includes all modifications falling within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. An alkaline photographic developer for silver emulsions comprising developing solution having the following formula:

Water	cc--	1000
Sodium sulphite	g--	12.6
Pyrogallol	g--	25.2
2,4-diaminophenol hydrochloride	g--	2.0
Sodium carbonate (monohydrated)	g--	49.6
Potassium bromide	g--	3.0

and an additive comprising 0.5 to 5.0 milliliters of a mixture comprising 10 grams of hydrazine and 90 grams of triethanolamine.

2. An alkaline photographic developer for silver emulsions comprising an aqueous developing solution having the following formula:

Monomethyl-p-aminophenol (metol)	g--	2
Sodium sulphite (desiccated)	g--	100
Hydroquinone	g--	5
Borax	g--	0.5

Water to make 1 liter.

and an additive comprising 0.5 to 5.0 milliliters of a mixture comprising 10 grams of hydrazine and 90 grams of triethanolamine.

References Cited in the file of this patent

UNITED STATES PATENTS

1,925,557 Dundon Sept. 5, 1933

OTHER REFERENCES

Mees: The Theory of the Photographic Process (1954), p. 663. (Copy in Div. 60.)