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3,276,874

PHOTOGRAPHIC DEVELOPER STARTER SOLUTIONS

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No Drawing. Filed Apr. 23, 1963, Ser. No. 274,954
3 Claims. (Cl. 96-66)

This invention relates to photographic silver halide developer compositions, and in particular to starter solutions for use with liquid developer-replenisher concentrates and to method for their use.

To prevent the working characteristics of a bath of photographic developer from changing seriously during development of a considerable quantity of exposed silver halide photographic material, and also to maintain the volume of the developer, it is common practice to add a replenisher. Such a replenisher is usually a highly concentrated aqueous solution of principal developer constituents that are consumed during development.

Commercial photographic developing baths are sometimes compounded by mixing water and a "starter" solution, which contains acid and bromide, with a solution hereafter termed "developer-concentrate." This concentrate is compounded so that it may be used with the starter for making a developing bath and may also be used alone or diluted with water, as a replenisher for the developing bath. The starter solution is needed to adjust the initial pH and bromide concentration in the developing bath. An important reason for the use of developer concentrates is the saving in the bulk of liquid to be stored and transported, and for the same reason it is advantageous for starter solutions to be concentrated. Hitherto, starter solutions for use with developer concentrates have been prepared from acetic acid and a soluble bromide such as potassium bromide.

The present invention provides starter solutions for such use that are prepared from hydrobromic acid instead of acetic acid as the source of hydrogen ions. The hydrogen bromide also provides some or all of the bromide ions for the starter solution. A concentration of at least 5% by weight of hydrobromic acid in the solution is preferred.

When more bromide ions are wanted in a starter solution than are provided by the hydrogen bromide, a soluble bromide salt, for example potassium bromide, can be added. It is usually possible to prepare a hydrobromic acid, potassium bromide starter that is more concentrated than one of equal performance would be if made with acetic acid and potassium bromide. Starter solutions prepared with hydrobromic acid are suitable for use with a wide range of developer-concentrates including those designed for developing negative and X-ray films.

The following example gives the formula of a preferred starter and developer-concentrate combination including a starter solution containing hydrogen bromide in accordance with the present invention:

Starter (solution A):

47% hydrobromic acid	ml	60
potassium bromide	g	40
water to make 200 ml.		

Developer concentrate (solution B):

1-phenyl-3-pyrazolidone	g	10
Hydroquinone	g	300
Borax	g	160
Potassium hydroxide	g	840
Potassium metabisulphite	g	1060
Potassium bromide	g	20
Water to 5 l.		

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Fresh developing solution is prepared by mixing together all of solutions A and B above, and adding water to make a total volume of 25 liters. A further quantity of the developer-concentrate solution B is prepared for use as a replenisher for the developing bath as needed.

The invention has been described in detail with particular reference to preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinabove and as defined in the appended claims.

We claim:

1. In a method of making a photographic silver halide developing bath which comprises the step of mixing a developer replenisher solution comprising:

1-phenyl-3-pyrazolidone	g	10
Hydroquinone	g	300
Borax	g	160
Potassium hydroxide	g	840
Potassium metabisulphite	g	1060
Potassium bromide	g	20
Water to 5 l.		

with a starter solution which contains acid and bromide ion, the improvement wherein the sole acid ingredient of said starter solution contains hydrogen bromide at a concentration of at least 5 percent by weight of said starter solution.

2. The improvement of claim 1 wherein said starter solution further contains a water soluble bromide salt to provide additional bromide ions.

3. In a method of making a photographic silver halide developing bath which comprises the step of mixing a developer replenisher solution comprised of

1-phenyl-3-pyrazolidone	g	10
Hydroquinone	g	300
Borax	g	160
Potassium hydroxide	g	840
Potassium metabisulphite	g	1060
Potassium bromide	g	20
Water to 5 l.		

with a starter solution consisting essentially of an acid and bromide ion forming compounds in aqueous solution in about the following proportions

47% by weight hydrobromic acid	ml	60
Potassium bromide	gm	40
Water	ml	200

the improvement wherein the acid constituent of said starter solution consists essentially of hydrobromic acid.

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