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PHOTOGRAPHIC DEVELOPERS

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The present invention relates to photographic developers.

One of its objects is a developer for photographic silver halide emulsions by which the silver halide is transformed into silver without previous exposure. Another object is a photographic developer for the reversal process. Further objects will be seen from the detailed specification following hereafter.

For many purposes, for instance for reversal development, it is often desirable that the second development should be possible without previous exposure to light; for example, when the film has been developed in a bath it is troublesome to have to remove the wet film from the bath, expose it to light and return it to the bath. It has been proposed to avoid this exposure by using as an equivalent expedient certain reducing substance, for instance hydrosulfite, thiosinamine or the like. Such reducing agents, however, are generally of very low stability and cannot be preserved; in addition they have other disadvantages, for instance a disagreeable odour.

The present invention relates to a method for avoiding the foregoing difficulties by using a new group of developers for the purpose in question, namely developers which contain in the molecule an atom grouping —CO—CHOH— or in tautomeric form —COH=COH—. This atom grouping may be in an open chain or in a heterocyclic nucleus. Such substances are, for example benzoin which may contain various substituents in the nucleus, dioxindols, 2,3 dihydroxythionaphthenes. These substances may be used either alone or in admixture with normal developers. The mixed developers have the property of developing first small silver nuclei which then, after this initial development, are further developed by the normal developer.

The following are examples of suitable developers:

I.	Dioxindol	grams	2
	Sulfite	do	10
	Potassium carbonate	do	6
	Water	cc	200
II.	Benzoin sulfonic acid	grams	2
	Sulfite	do	10
	Sodium hydroxide	do	0.6
	Water	cc	200
III.	Dioxindol	grams	2
	Hydroquinone	do	10
	Sulfite	do	50
	Potassium carbonate	do	30
	Water	cc	1000
IV.	2,3 dihydroxythionaphthene	grams	2
	Sulfite	do	10
	Potassium carbonate	do	6
	Water	cc	200

When an unexposed film is developed in any of these developers there is produced in 5–10 minutes of developing period a complete blackening.

What we claim is:

1. In a process of producing reversal images in exposed silver halide emulsions the step which comprises carrying out the second development without exposure between first and second development by means of a developing bath the active component of which is formed by a compound selected from the group consisting of benzoines, dioxindoles and 2,3 dihydroxythionaphthenes.

2. In a process of producing reversal images in exposed silver halide emulsions the step which comprises carrying out the second development without exposure between the first and second development by means of an ordinary developing bath containing a compound selected from the group consisting of benzoins, dioxindoles and 2,3 dihydroxythionaphthenes.

3. In a process of producing reversal images in exposed silver halide emulsions the step which comprises carrying out the second development without exposure between first and second development by means of a developing bath comprising a dioxindol.

4. In a process of producing reversal images in exposed silver halide emulsions the step which comprises carrying out the second development without exposure between first and second development by means of a developing bath comprising a 2,3 dihydroxythionaphthene.

5. In a process of producing reversal images in exposed silver halide emulsions the step which comprises carrying out the second development without exposure between first and second development by means of a developing bath comprising a substituted benzoin.

6. In a process of producing reversal images in exposed silver halide emulsions the step which comprises carrying out the second development without exposure between first and second development by means of a developing bath having the following composition:

Dioxindol	grams	2
Sulfite	do	10
Potassium carbonate	do	6
Water	cc	200

7. In a process of producing reversal images in exposed silver halide emulsions the step which comprises carrying out the second development without exposure between first and second development by means of a developing bath having the following composition:

2,3 dihydroxythionaphthene	grams	2
Sulfite	do	10
Potassium carbonate	do	6
Water	cc	200

8. In a process of producing reversal images in exposed silver halide emulsions the step which comprises carrying out the second development without exposure between first and second development by means of a developing bath having the following composition:

Benzoin sulfonic acid	grams	2
Sulfite	do	10
Sodium hydroxide	do	0.6
Water	cc	200

9. A photographic developing bath for silver halide emulsions comprising a compound selected from the group consisting of benzoins, dioxindoles and 2,3 dihydroxythionaphthenes.

10. A photographic developing bath for silver halide emulsions having as the active component a compound selected from the group consisting of benzoins, dioxindoles and 2,3 dihydroxythionaphthenes.

11. A photographic developing bath for silver halide emulsions comprising a dioxindol.

12. A photographic developing bath for silver halide emulsions comprising a 2,3 dihydroxythionaphthene.

13. A photographic developing bath for silver halide emulsions comprising a substituted benzoin.

14. A photographic developing bath for silver halide emulsions having the following composition:

Dioxindol	grams	2
Sulfite	do	10
Potassium carbonate	do	6
Water	cc	200

15. A photographic developing bath for silver halide emulsions having the following composition:

2,3 dihydroxythionaphthene	grams	2
Sulfite	do	10
Potassium carbonate	do	6
Water	cc	200

16. A photographic developing bath for silver halide emulsions having the following composition:

Benzoin sulfonic acid	grams	2
Sulfite	do	10
Sodium hydroxide	do	0.6
Water	cc	200

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