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STABILIZED TRICHLOROCYANURIC ACID

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The present invention relates to bleaching compositions and, in particular, to bleaching compositions based on chlorinated cyanuric acids and to means of stabilising them.

Tri-, di-, monochlorocyanuric acid and mixtures thereof, which substances are meant by the term "chlorinated cyanuric acid" used herein, are well known bleaching agents which have been incorporated in bleaching compositions of various kinds. In particular, they have been incorporated in scouring bleaching compositions containing, in addition, large amounts of finely-divided abrasive material such as silica or felspar, together with minor amounts of alkaline or neutral salts, such as sodium carbonate, sodium orthophosphate, pyrophosphate or tripolyphosphate, sodium silicates and sodium sulphate and of wetting or detergent agents, such as sodium alkylbenzene sulphonates. However, the stability of compositions containing these bleaching agents, especially trichlorocyanuric acid, under normal conditions of storage leaves much to be desired, considerable loss of active chlorine taking place in the time which may elapse between their manufacture and sale to the actual user.

It has now been found that such compositions can be stabilised against a loss of active chlorine by the addition to them of certain phenolic compounds.

The invention provides a bleaching composition containing a chlorinated cyanuric acid, as hereinbefore defined, stabilised by a phenol.

Stabilisation of chlorinated cyanuric acid in accordance with the present invention can be effected in dry particulate bleaching compositions, laundry and dishwashing powders and scouring cleansers which give neutral, acidic or alkaline solutions in water.

Phenolic compounds suitable for the stabilisation of chlorinated cyanuric acids in accordance with the present invention include ring substituted mono-, di- and trihydroxy aromatic compounds. Particularly suitable are m-cresol, p-cresol, thymol, carvacrol, catechol and resorcinol.

The amount of stabilising compound to be used depends upon a number of factors, such as the physical form of the chlorinated cyanuric acid and the nature of the stabilising compound to be used, the nature and amount of the other ingredients of the composition and the conditions under which it may be stored. Appreciable increases in stability may be obtained with as little as

1%, by weight of the chlorinated cyanuric acid, of stabilising compound according to the invention, while amounts of up to 50% are generally more than adequate to give substantially complete stability for normal compositions and times and conditions of storage. It is preferred to use from 2% to 20% of stabilising compound by weight of the chlorinated cyanuric acid.

In preparing compositions of the invention, care must be taken that the chlorinated cyanuric acid and the stabilising compound are not brought into contact with one another before at least one of them is, and preferably both are, diluted with or absorbed on some of the other ingredients of the composition. A slight loss of available chlorine is generally found to have taken place during the process of mixing a chlorinated cyanuric acid with the other ingredients of a bleaching composition such as a bleaching scouring powder.

Many of the stabilising compounds of the invention are soluble in or miscible with the perfume normally used in commercial bleaching or detergent compositions. A preferred method of incorporating the stabilising compounds in such cases is to form a perfume-stabiliser solution which is then sprayed onto the remainder of the bleaching composition.

The invention is further illustrated by the following examples.

Example 1

Scouring powders of the following compositions were made up:

Ingredient:	Percentage by weight
Soduim dodecyl benzene sulphonate (85% a.d.)	4.4
Sodium tripolyphosphate	2.0
Soduim carbonate	1.0
Trichlorocyanuric acid	0.56
m-Cresol	0.05
Fine silica, balance to 100%.	

The procedure in making up the composition was as follows. The sodium dodecylbenzene sulphonate and the inorganic salts were lightly ground with about 10% of the silica. The trichlorocyanuric acid was mixed with a further small amount of the silica (about 10%) and the two mixes were then mixed thoroughly with the bulk of the remaining silica by rolling. The stabilising compound was added last as a mixture with the rest of the silica containing 1 to 6% of the compound.

Samples of about 300 g. of this composition were stored in aluminium-foil-wrapped cylindrical cardboard canisters, of the type normally used for the retail sale of domestic scouring powders, under three different conditions of temperature and relative humidity for three months. Table A gives the loss of active chlorine during storage.

TABLE A

Example	Compound	Amount (percent of total composition)	Mixing loss, percent	Percent Loss of active chlorine during storage at—					
				20° C./90% R.H., Months		28° C./70% R.H., Months		37° C./70% R.H., Months	
				1	3	1	3	1	3
Control [1]			11	9	41	31	66	38	86
1	m-Cresol	0.05	24	0	0	0	2	35	66

[1] The control composition is included for purposes of comparison only and is not within the scope of the invention described herein.

Examples 2–6

Scouring powder compositions were made in the manner described for Example 1, substituting the phenol listed in Table B for m-cresol.

Samples of about 10 gm. of each of these compositions were stored in sealed glass tubes at 50° C. Table B gives the losses of active chlorine during the storage periods.

TABLE B

Example	Compound	Percent of compound in total composition	Percent loss of available chlorine during storage		
			1 week	2 weeks	4 weeks
Control			30	37	
2	Thymol	0.05	16	33	
3	Carvacrol	0.05	5	26	
4	p-Cresol	0.05	6	20	
Control			34	41	69
5	Catechol	0.05	15	27	57
6	Resorcinol	0.05	0	0	54

Examples 2, 3 and 4 were tested together, in comparison with a control which had no stabiliser added. Examples 5 and 6 were tested together against a control which had no stabiliser added.

Examples 7–11

Scouring powder compositions made as described in Examples 2–6, containing 0.05% phenolic compound based on composition, were stored in 10½ oz. standard foil-covered canisters. Table C gives the losses of active chlorine during 1 month's storage at different temperature/relative humidity values.

TABLE C

Example	Compound	Percent mixing loss of available chlorine	Percent loss of available chlorine	
			20° C./90% R.H.	37° C./70% R.H.
Control		6	18	76
7	Thymol	6	16	49
8	Carvacrol	15	0	34
9	p-Cresol	19	3	71
10	Resorcinol	44	0	9
11	Catechol	17	12	54

The control compositions given in Tables B and C are included for comparative purposes only, and are not within the scope of the invention.

What is claimed is:

1. A bleaching composition consisting essentially of an effective amount of trichlorocyanuric acid stabilised against loss of active chlorine by a stabilising amount of a phenol selected from the group consisting of m-cresol, p-cresol, thymol, carvacrol, catechol and resorcinol.

2. A composition according to claim **1** in which the amount of said stabilising phenol is from about 1% to about 50% by weight of the trichlorocyanuric acid.

3. A composition according to claim **2** in which the amount of stabilising phenol is from about 2% to about 20% by weight of the trichlorocyanuric acid.

References Cited by the Examiner

UNITED STATES PATENTS

2,980,622	4/1961	Symes	252—99
3,108,077	10/1963	Wixon	252—99 XR
3,108,078	10/1963	Wixon	252—99 XR
3,108,079	10/1963	Wixon	252—99 XR

OTHER REFERENCES

Rose: "Condensed Chemical Dictionary," 6th ed., 1962 (pages 958 and 1141 relied on).

Gregory: "Uses of Applications of Chemicals and Related Materials," vol. II, 1944, page 327.

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