

[54] **STERILE DRYCLEANING
COMPOSITION AND METHOD FOR
STERILIZING FABRICS**

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8/142

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[57] ABSTRACT

A method for sterilizing drycleaning fluids and fabrics cleaned
 therein which consists of incorporating into the drycleaning
 fluid from 0.005 to about 1.0 percent by weight (50 to 10,000
 p.p.m.) of 2,2-dibromo-2-cyanoacetamide.

3 Claims, No Drawings

[56] References Cited

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STERILE DRYCLEANING COMPOSITION AND METHOD FOR STERILIZING FABRICS

BRIEF DESCRIPTION OF INVENTION

In accordance with the present invention, a drycleaning fluid such as an aliphatic or aromatic hydrocarbon or a chlorinated hydrocarbon can be sterilized and maintained sterile to most micro-organisms, e.g., Staph. aureus, Pseudo. aeruginosa, by incorporating into the cleaning fluid from 0.005 to about 1.0 percent by weight of 2,2-dibromo-2-cyanoacetamide. A drycleaning fluid so sterilized will also sterilize fabrics which are contacted with the fluid as in a conventional drycleaning operation.

Suitable drycleaning fluids which can be sterilized by the method of this invention are the halogenated hydrocarbons having from one to four carbon atoms and two to six chlorine, fluorine or bromine atoms, the aliphatic hydrocarbon solvents commonly employed for drycleaning such as Stoddards solvents, the naphthas and the like, as well as the aromatic solvents benzene and toluene. Representative of the halogenated hydrocarbons are methylene chloride, carbon tetrachloride, dichloroethylene, trichloroethylene, perchloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, dibromotetrafluoroethane, tetrachlorodifluoroethane, trichlorofluoromethane, trichlorofluoroethane, trichlorotrifluoroethane. The bromo analogs of the chloro and fluoro compounds are not widely available and are very costly to employ as drycleaning agents. However, like the chloro and fluoro analogs, the bromo compounds will be sterilized by the method of the present invention.

Drycleaning fluids employed by the industry today include detergents, the anionics and nonionics, such as the ethylsulfonates, the phosphate esters, the polyalkoxy alkanol sulfates and sulfonates, the polyalkoxy alkanols, the polyalkoxy alkyl phenols and the like. In addition, the cleaning fluids may contain soil release compounds, hand agents, softeners, and the like.

The amount of the 2,2-dibromo-2-cyanoacetamide necessary to sterilize the cleaning fluid is relatively small, in the range of from 0.005 to about 0.05 percent by weight. When employed to maintain a sterile condition during repeated usage of the cleaning fluid as in drycleaning, it has been found advantageous to maintain from about 0.01 to about 0.5 weight percent (100 to 5,000 p.p.m.) of the agent in the cleaning fluid at the start of each cleaning cycle for the fluid. The agent may be added periodically to bring the level of agent in the fluid to an amount within the range 0.005 to 1.0 weight percent or may be added before each cycle or during each cycle in an amount to insure the cleaning fluid has a predetermined amount of the agent in contact with the agent and fabric during that cycle. Larger amounts may be employed but are not necessary since the above-recited amounts are effective for the purposes intended. When fabrics are cleaned in the conventional manner in a drycleaning solvent which contains the 2,2-dibromo-2-cyanoacetamide, the fabric is found to be sterile as evidenced by having no bacteria recoverable therefrom. However, the compound is not normally carried out with the fabric since little or no residual sterilizing effect is obtained by the fabric after cleaning. The principal advantage of the present invention is to prevent cross-contamination of micro-organisms during cleaning and to produce a sterile

fabric which must again contact micro-organisms before it becomes a habitat.

DETAILED DESCRIPTION OF THE INVENTION

The following examples illustrate the present invention but are not to be construed as limiting.

Two-inch-square cloth swatches of various fabrics were dipped into 24-hour broth culture (diluted 1:10) of the test organisms, S. aureus and P. aeruginosa. Duplicates of all cloths were made, one to be cleaned with fluid containing a bactericide or bacteriostat, the other to be a control, being cleaned in the fluid only. The cloth swatches were dried at 37° C. for 20-30 minutes. These swatches were then cleaned in a commercially available drycleaning fluid which contained detergents. The cleaning was conducted under a condition in which the solvent contained 70 percent of its water of saturation, a condition known as 70 percent solvent relative humidity (SRH). The swatches, after exposure to the cleaning fluids, were dried on sterile Petri dishes, then placed in 10 ml. of sterile physiological saline solutions and bacterial counts made on the micro-organisms recovered from the cloth. A bacterial count was also made on the cleaning solution. The results of these experiments are set forth in the table.

The drycleaning fluid was sterile as indicated by plating ca. 0.2 ml. onto a nutrient agar plate at 37° C., letting the fluid evaporate and checking for subsequent growth two days later.

[All tests conducted in commercial grade of perchloroethylene dry cleaning solvent containing detergent]

P.p.m. Agent	Bacteria count in fluid after cleaning	
	S. aureus	P. aeruginosa
0	1.2·10 ³	1.2·10 ⁴
4,000 2,000	inn.*	inn.*
500 100	inn.*	1.2·10 ³
500 100	0 0	0 0

¹ Commercial grade of bacteriostat sold by Bayer, A.G. under trade name Movin DC.

² Commercial bacteriostat sold by Geigy Chemical, A.G. under trade name C.H. 3565.

*inn. = Innumerable bacteria, too many to count.

We claim:

1. A method for sterilizing drycleaning compositions and drycleanable fabrics cleaned therein without retaining the sterilizing agent on said fabric which consists essentially of maintaining in said drycleaning composition from 50 to 10,000 p.p.m. of 2,2-dibromo-2-cyanoacetamide.

2. The method of claim 1 wherein said 2,2-dibromo-2-cyanoacetamide is present in from between 100 and 5,000 p.p.m.

3. In a method for drycleaning fabrics wherein the fabric is contacted with a drycleaning fluid, the fluid removed from the fabric and the fluid reused to dryclean a different fabric, the improvement which consists essentially of sterilizing the drycleaning fluid and fabric cleaned therein by maintaining in intimate admixture with said fluid from 100 to 5,000 p.p.m. 2,2-dibromo-2-cyanoacetamide, whereby the fabric on being removed from the cleaning fluid after extraction of the fluid is substantially free of said 2,2-dibromo-2-cyanoacetamide.

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