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2,824,070

PROTECTIVE PREPARATION AGAINST
MUSTARD VAPOR

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The invention described herein may be manufactured and use by or for the Government for governmental purposes, without the payment to us of any royalty thereon.

This invention relates generally to compositions of matter adapted to protect various surfaces against mustard gas and like vesicants, and particularly to protect the skin or surface of the human flesh against such chemical warfare agents.

The blistering and corrosive effects of mustard gas on the human flesh, animals, and materiel are well known, and a number of compositions and medicaments have been developed or proposed for protecting against this insidious vesicant. Chemically, mustard gas is bis (beta-chlorethyl) sulfide and, although it is generally referred to as "mustard gas," it is actually encountered on the battlefield in both the liquid and vapor state. Accordingly, where the expression "mustard gas" is used hereinafter, both the vesicant liquid and vapor are referred to unless otherwise specified.

The primary object of our invention is to provide a new and useful composition of matter particularly adapted to adhere to and adequately protect the human skin and tissue against mustard gas vapor and to limit the degree of injury normally resulting from liquid mustard gas burns. One requirement which our new composition meets to a high degree in connection with this object is its compatibility with the skin and non-irritation thereof. The value of the invention is enhanced in that the new composition of matter may also be advantageously used for several different purposes. For example, it has been found that it may be used to protect the legs of horses against mustard gas and also as a mustard resistant paint for steel and other metal surfaces, since it will adhere firmly thereto and is not easily washed off or checked by rain or heat.

Other objects of and uses for the invention will in part be obvious, and will in part appear hereinafter in the following detailed description thereof.

The compound sym dichlor bis (2,4,6 trichlorophenyl) urea contains available chlorine for reacting with mustard gas so as to chlorinate the same and convert it into a harmless, non-vesicant material. Chlorination of mustard gas in this manner is the approved method of destroying this dangerous vesicant agent. However, considerable difficulty is involved in incorporating the vesicant-destroying compound in a suitable carrier so that it may be freely painted or brushed on various surfaces and then retained thereon in a firmly adherent film.

It has been found that our composition having the following formula in percent of ingredients by weight is particularly satisfactory:

Sym dichlor bis (2,4,6 trichlorophenyl) urea powder	20.50
Magnesium oxide (heavy)	2.25
Rosin (commercial grade B)	1.50
Carbon tetrachloride (commercial)	75.75
	100.00

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In compounding, the rosin may be first dissolved in the carbon tetrachloride. The magnesium oxide and sym dichlor bis (2,4,6 trichlorophenyl) urea powder may then be added and the mixture well triturated so as to obtain a homogeneous product. The finished product should be kept in a brown glass stoppered bottle.

When this composition is applied to the human skin, or other surfaces, the carbon tetrachloride readily evaporates leaving a firmly adherent film of the mustard-destroying agent, rosin adhesive, and magnesium oxide thickener thereon.

As indicated above, the composition limits somewhat the degree of injury from liquid mustard gas by partial neutralization thereof, and also by protecting the surrounding skin from the vapor which is evolved.

Suitable tests have been made to determine the properties of our composition as to the loss of available chlorine on storage, with the following results over a four-month period:

Date	Percent of available chlorine	
	Powder, ¹ percent	Liquid, ² percent
Initial	53.51	17.88
1st month	50.35	15.94
2nd month	49.72	15.67
3rd month	48.89	15.36
4th month	48.23	15.04

¹ The powder was made by evaporating the solvent from the composition and grinding the residue.

² The solution was stored in a glass stoppered brown bottle at room temperature in a cabinet, the bottle being placed in a glass container which was partly filled with carbon tetrachloride and hermetically sealed. This precaution was necessary to prevent the evaporation of the solvent from the sample during storage.

Since certain changes may be made in the foregoing composition and method of compounding without departing from the scope of the invention, it is intended that the foregoing description shall be interpreted as illustrative and not in a limiting sense.

What is claimed as the invention is:

1. A composition of matter having substantially the following composition in parts by weight:

Sym dichlor bis (2,4,6 trichlorophenyl) urea powder	20.50
Magnesium oxide (heavy)	2.25
Rosin	1.50
Carbon tetrachloride (commercial)	75.75

2. The method of making a composition of matter for the protection of various surfaces against mustard gas which comprises dissolving about 1.50 parts by weight of rosin in about 75.75 parts by weight of carbon tetrachloride, adding about 2.25 parts by weight of magnesium oxide (heavy) and about 20.50 parts by weight of sym dichlor bis (2,4,6 trichlorophenyl) urea powder to the carbon tetrachloride, and triturating the mixture thoroughly until homogeneous product is obtained.

References Cited in the file of this patent

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