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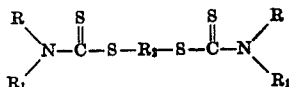
1 Claim. (Cl. 260—455)

This invention relates to alkylene dithiocarbamates and to their preparation.

This invention has as an object the production of new and useful compositions of matter. A further object is the preparation of alkylene dithiocarbamates. Other objects will appear hereinafter.

These objects are accomplished by the following invention which comprises reacting a salt of a dithiocarbamic acid with a dihalo acyclic hydrocarbon as more fully described hereinafter.

The products of this invention are represented by the following formula



wherein not more than one hydrogen is attached to each nitrogen, i. e., at least two valences of each nitrogen are attached to carbon, R and R₁ are selected from the class consisting of hydrogen, hydrocarbon radicals which, together jointly with the nitrogen, form a heterocyclic ring and R₂ is a bivalent acyclic hydrocarbon radical.

The more detailed practice of the invention is illustrated by the following example wherein parts given are by weight. There are, of course, many forms of the invention other than this specific embodiment.

Example

A mixture of 188 parts of sodium dimethyldithiocarbamate and 85 parts of methylene dichloride in 520 parts of ethyl alcohol was refluxed with stirring for two hours. The reaction mixture was then cooled in an ice bath and the solution filtered. The solid reaction product was twice washed with ethyl alcohol and then washed thoroughly with water. There was obtained 127 parts of methylene bis-dimethyldithiocarbamate, melting at 154° C. Analysis: Calculated for C₇H₁₄N₂S₄: N, 11.03; found: N, 11.02.

Although the invention is illustrated by the reaction of sodium dimethyldithiocarbamate with methylene dichloride, it is applicable to salts of dithiocarbamic acids in general. Ex-

amples of other salts of dithiocarbamic acids which are operative include sodium methyl-dithiocarbamate, sodium butyldithiocarbamate, sodium cyclohexyldithiocarbamate, sodium phenyl-dithiocarbamate, sodium benzyldithiocarbamate, zinc diethyldithiocarbamate, magnesium dibutyldithiocarbamate, potassium diisopropyl-dithiocarbamate, sodium dicyclohexyldithiocarbamate, sodium ethylphenyldithiocarbamate, sodium dibenzyldithiocarbamate, sodium pentamethylenedithiocarbamate, sodium hexamethylenedithiocarbamate, sodium methylphenyldithiocarbamate and sodium 4-morpholinecarbodithioate.

Acyclic dihaloalkanes which are operative in the process of this invention, in addition to methylene dichloride, include methylene dibromide, ethylene dichloride, ethylene dibromide, ethylene diiodide, trimethylene dibromide, hexamethylene dichloride, decamethylene dibromide and ethylidene dichloride.

Solvents other than ethyl alcohol can be used as the medium for the preparation of the alkylene dithiocarbamates. These include alcohols such as methyl alcohol, propyl alcohol, and isobutyl alcohol; ketones such as acetone and methyl ethyl ketone; ethers such as diethyl ether, dibutyl ether and dioxane; and hydrocarbons such as petroleum ether, benzene and toluene.

The reaction is generally carried out at a temperature within the range of 25° to 150° C. However, it is convenient to operate at the boiling point of the solvent used as the reaction medium.

The products of this invention are useful for various commercial purposes. They may be used as pharmaceutical and pest-control agents, e. g., insecticides, fungicides, moth-proofing agents, and as additive agents for elastomers.

As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that this invention is not limited to the specific embodiments thereof except as defined in the appended claim.

What is claimed is:

Methylene bis(dimethyldithiocarbamate).

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