

1

2,807,565

HYDRAZINE COMBUSTION MIXTURES

Cecil A. Rush and Stewart S. Cruikshank, Baltimore, and Samuel Sass, Edgewood, Md., and Thomas N. Zenk, Minneapolis, Minn., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Application July 21, 1955,
Serial No. 523,639

5 Claims. (Cl. 167—40)

(Granted under Title 35, U. S. Code (1952), sec. 266)

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

This invention relates to the dissemination of pesticides, colored smokes, toxic agents, and other substances capable of being sublimed or vaporized and is more particularly concerned with the combustion mixture employed to generate the heat necessary to disseminate such vaporizable substances.

It is well known that toxic agents such as insecticides, and colored smokes can be disseminated by incorporating such substances with a combustible composition, so that when said composition is ignited it burns slowly, vaporizing and disseminating the active agent or dispersible material as finely divided particles. However, the combustible mixtures heretofore used were also capable of inflaming or having its vapors ignite. In addition, the combustible mixtures heretofore employed produced relatively high temperatures and such high temperatures severely limited the class of dispersible agents which could be employed therewith, since the organic toxic agents and dyestuffs normally desired to be dispersed would be decomposed at the high temperatures generated by the combustible mixtures.

Accordingly, it is an object of this invention to provide a combustible mixture which is capable of generating sufficient heat so that the agent desired to be dispersed can be vaporized, and yet does not generate so high a degree of heat that the active agent is decomposed.

It is a further object of this invention to provide a combustible mixture useful for vaporizing and disseminating toxic agents, colored smokes and the like by the heat generated by its combustion and which does not burn with a flame.

Other objects will in part appear in and in part be obvious from the following detailed description.

In accordance with this invention, it has been found that a mixture of hydrazine and potassium persulfate provides a combustible mixture which accomplishes the objects set forth above. This mixture when ignited by means of a match device, fuse, hot metal wire, or other igniting device, produces local melting and combustion. The combustion then spreads evenly through the mass liberating large amounts of gas and steam, and causing vaporization and dispersal, as finely divided particles, of the organic active agent which had been incorporated with the combustible mixture.

The active agents which may be dispersed in this manner include organic dyestuffs used in smoke generating compositions such as flares and the like, toxic agents,

2

and insecticides. Among the organic dyestuffs capable of being dispersed in this manner are alpha-amino-anthraquinone, auramine hydrochloride, 1,4-diamino-2,3-dihydro-anthraquinone, 1-methyl-amino anthraquinone, 1,4-di-p-toluidino-anthraquinone, auramine hydrochloride, and mixtures of one or more of these dyestuffs. Among the insecticides found useful in this invention are DDT, benzene hexachloride or lindane, chlordane, and the organic phosphorous materials such as hexaethyl tetraphosphate and tetraethyl pyrophosphate.

One composition which has been found particularly effective and which will illustrate the invention comprises:

Ingredient:	Parts by weight
Potassium persulfate	4
Hydrazine	1
DDT	1

The ingredients in the proportions indicated are intimately mixed in finely divided form. The resulting mixture may be packaged in various containers, or pelletized in any desired shape. The reaction may be started by means of a lighted match, fuse or other igniting device.

Other modifications of the invention can be made by those skilled in the art, such as the addition of odorant agents, the addition of inert mineral fillers such as fuller's earth, China clay, expanded perlite and the like for slowing the reaction rate and aiding the mixture in the accommodation of organic compounds which are liquids, and other such modifications as would be employed by those skilled in the art for modifying formula properties. Such modifications do not depart from the intended scope of the invention.

We claim:

1. A low heat producing combustion mixture comprising 4 parts of potassium persulfate and 1 part of hydrazine.

2. A low heat gas producing composition comprising a major portion of a low heat combustion mixture formed from 4 parts of potassium persulfate and 1 part of hydrazine and a minor portion of a low temperature vaporizable organic active agent.

3. A low heat gas generating composition for combatting insects, comprising a major portion of a low heat combustion mixture formed from 4 parts of potassium persulfate and 1 part of hydrazine and a minor portion of a low temperature vaporizable insecticide.

4. A low heat gas generating composition for combatting insects, comprising a major portion of a low heat combustion mixture formed from 4 parts potassium persulfate and 1 part of hydrazine and a minor portion of DDT.

5. A gas generating composition for combatting insects comprising one part hydrazine, four parts potassium persulfate, and one part DDT, all parts by weight.

References Cited in the file of this patent

UNITED STATES PATENTS

2,695,258 Johnstone Nov. 23, 1954

OTHER REFERENCES

Audrieth et al.: The Chemistry of Hydrazine (1951) pp. 119 and 120.

Lessing: Scientific American, vol. 189, No. 1, July 1953, pages 30-33, "Hydrazine."