

ARSINE GAS (ARSENIURETTED HYDROGEN)

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MILITARY TERM

ARTHUR GAS --- DETECTION & TREATMENT

GENERAL -

This substance is a true Gas- It should not be confused with the nose gases which are toxic gases and not true gases. It might be employed in the gas form or as a powder called Calcium Arsenide which resembles calcium carbide in appearance and generates arsine gas when in contact with moisture.

A2.

CHARACTERISTICS -

This Gas is Non-Persistent, is Invisible, and has no smell except in high concentrations, when there may be a Faint smell of Garlic, similar to that of mustard gas. It may therefore except in high concentrations be detected only by the use of specially treated paper which will be known as (DECTOR PAPER TYPE A) (A description of this paper and its use is given in the appendix to this paper.

This paper will not at present be issued except to gas identification Officers, but a stock will be held at Regional Stores ready for distribution if the need for them should arise.

B2.

The powdered calcium arsenide may be seen as a grayish white powder on the ground, but it will have no smell. It will, however, in contact with moisture continue to give off arsine for a period up to one hour while the chemical reaction is taking place. It is non-corrosive and non-vesicant. It will contaminate any water into which it falls, and which should be treated as dangerous until treated and tested by the Medical Authorities.

LIMITATIONS OF ARSINE.

It must be realized that there are several limitations to the use of this gas by an enemy, it dissipates rapidly. There are two probable means of attack, viz - "A" - As a gas in large aircraft bombs, or in projector or cylinder attacks, in which case concentrations could be set up which would be effective locally.

"B"- By spreading the powder from projectiles or bombs, or as an aircraft spray at frequent intervals, (daily over a period) to obtain cumulative effect with low concentration. These limitations make it unlikely that this gas could be used effectively against the civil population.

N O T E

It has recently been discovered that it is possible to treat Arthur Powder so that it resembles coal cinders in one form, or ordinary earth in another. For this reason it will be necessary to rely almost entirely on detector paper type "A 2" which is a paper further developed to increase sensitivity in detector paper type "A Mark 11 "

EFFECTS

This gas acts as a blood poison, and exposure without a respirator to a high concentration may prove fatal. Low concentrations breathed for a long period of several hours, or frequently

at short intervals may also have serious results owing to the cumulative effect of this gas.

TABLE OF CONCENTRATION , and EFFECT

| | |
|-------------|---------------------------------------|
| 1/5,000 | Rapidly Fatal |
| 1/35,000 | Fatal in (30) Thirty minutes exposure |
| 1/500,000 | Fatal in (2) Two hours exposure |
| 1/1,500,000 | Dangerous after (1) One hour exposure |

ARSINE GAS - Continued

Cases may be divided into three types:

1. Mild form of poisoning. A few hours, or even days, after the exposure the patient experiences great weariness with headache and sometimes vomiting, the face becomes pale and after a further 24 to 48 hours, the skin becomes yellow.

The case recovers in 8 to 15 days.

2. Medium form of poisoning. In 4 to 8 hours after the symptoms appear (as in 1) the patient passes urine which is red in colour. The skin develops a characteristic orange-yellow tint, these cases take months to recover.

3. Severe form of poisoning. In 4 to 8 hours after exposure the patient has a violent attack of shivering, overwhelming fatigue, difficulty in breathing, and pains in the back and chest. In 6 to 8 hours, he passes urine which is red in colour and he may then cease to pass urine. On the third day his skin becomes coppery colour and death takes place between the third and tenth day.

PROTECTION -

The Government service Respirator gives protection against the concentration which are likely to be met with

CASUALTIES -

Persons suffering from the effects of the gas should be made stretcher cases. Patient should be kept warm and given hot tea sweetened, and should be taken to receive medical attention as soon as possible.

DECONTAMINATION -

Decontamination of ground contaminated with powdered calcium arsenide.

The same principles apply as for blister gases, except that this is not a vesicant. Protective clothing is not necessary, though respirators must be worn.

Instructions for detector paper types "A" and type " A 11"

Storing -

These paper detectors are contained in envelopes each holding five. Envelopes will be used to protect the detectors not in use from contamination and weather. Further protection should be obtained by storing envelopes in cigarette tins, sealed with adhesive tape, detectors will quickly lose their efficiency if not protected.

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METHOD OF USE-

Detectors should not be put out horizontally like "Detectors for gas Spray" now in use, but be hung vertically at about mouth level, so that the air can circulate around them. As there is difficulty at night in telling by torchlight whether the white detector has turned yellow, a piece of ordinary white paper should be hung alongside the detector for comparison.

REACTION OF ARSINE GAS ON DETECTOR PAPER-

In the presence of Arsine the Detector changes colour to yellow or orange, according to concentration, then the gas alarm must be given immediately, and respirators worn until fresh detectors show that no gas is present. Frequent tests should be made during the alarm by waving fresh paper in the air when they quickly show a change of colour, if the gas is still present. Discoloured detectors should always be replaced with fresh white ones after an attack.

THE DETECTOR PAPERS ARE ALSO AFFECTED BY HYDROGEN SULPHIDE, but are much less sensitive to this gas than to ARSINE. After long exposure to traces of hydrogen sulphide the papers show a yellowish stain, somewhat similar to that produced by low concentrations of arsine. In higher concentrations of arsine, such as are harmful for even a short exposure, the orange color which is rapidly produced on the test papers is readily distinguished from that given by hydrogen sulphide. Since, however, traces of hydrogen sulphide are often to be found in industrial towns, gas detection officers and others must exercise care before reporting the presence of arsine, when only a faint yellowish stain is observed.

POISON

THE CHEMICALS USED IN THE DETECTORS ARE POISONOUS, and must be kept clear of food and drinking water, there is no danger in handling the detectors.