

It is obviously desirable for the toxicity evaluation procedures to reproduce as faithfully as possible the effects of the route by which the chemical warfare agent penetrates the organism: inhalation or percutaneously. This approach is not very usual in scientific laboratories where use is generally made of injection; however, the lethal dose by intraperitoneal or subcutaneous injection (LD 50), although proposed as the toxicity criterion, reflects only very remotely inhalation or percutaneous toxicity. The ratio between the toxicities measured by the various routes of entry to the organism is not constant and may vary by a factor of 1 to 10 depending on the substance.

Canada has described a method for determining inhalation toxicity (LCt 50) which might, in our view, be acceptable as a norm after some further work (CCD/387).

Better still, Canada has proposed a simpler, quicker and cheaper method which consists in comparing the toxicity of the substance in question with one or more reference substances, the toxicity of which corresponds to the selected threshold (CCD/473).

Single-purpose chemical agents

The manufacture of these compounds (organophosphorous compounds, carbamates, yperites) which are the most toxic, should be totally prohibited.

To categorize them, it is necessary to define a toxicity threshold. The United States of America and the USSR have agreed on an inhalation toxicity threshold (LCt 50) of $2,000 \text{ mg}\cdot\text{min}/\text{m}^3$; this makes it possible to include all the compounds referred to above in the category of single-purpose agents and seems very suitable. However, it is necessary to find a reference substance whose inhalation toxicity corresponds to that value.

In this specific instance, it should be noted that inhalation toxicity does not cover all specific cases; for example, carbamates are more toxic if they are introduced into the organism by a projectile than if they are inhaled. It would therefore be useful to supplement the criterion of inhalation toxicity, in this particular case at least, by the evaluation of intraperitoneal-injection toxicity. The United States suggests a threshold of $0.5 \text{ mg}/\text{kg}$, which is acceptable, although it can also apply to certain dual-purpose agents.

Moreover, some groups of very toxic compounds can be defined by their structure. With some very few exceptions, organophosphorous chemical warfare agents are derived from methylphosphoric acid, while the structure of organophosphorous pesticides is based on phosphoric acid.