

Although it is of interest for toxicological studies of aerosols to cover, in addition to the danger from inhalation, the danger deriving from contact with the mucous membranes, eyes or skin, and the dangers of ingestion and its local and systemic effects, tests for the quantitative determination of LTC 50 should be independent so as to permit the calculation of the proportion of aerosol actually absorbed by respiration. Responses of a psychological nature due to alarm or fear should not be omitted, although they are less important for the purposes of a convention (incapacitating and psychochemical agents).

For a study of the acute toxicity of aerosols, the methods recommended by the National Research Council of North America (2) or the World Health Organization (3) can be used.

The Federal Hazardous Substances Labelling Act (4) recommends the use of a test chamber containing rats, rabbits and guinea pigs at three levels, with constant humidity and temperature. The quantity of aerosol injected into the chamber together with filtered air and the concentration of the substances inside the chamber are determined by experiment. The lethal dose for 50 per cent (LD 50) of the animals is determined.

The systemic response to the quantity of aerosol reaching the bloodstream can be studied by sophisticated instruments (polygraphs, etc) or detected by elementary observation.

Sachsse, Ullmann and others (5) have designed a device comprising four independent units, each constituted by two cylinders of rigid polyvinyl placed one above the other. The upper cylinder is approximately 650 mm high and 300 mm in diameter; the lower cylinder is 300 mm high and under it is placed a rotating disc. This lower cylinder has, at 120 mm and 240 mm from its base, two equidistant threaded orifices of a diameter of 50 mm to which are connected the tubes (160 x 152 mm for rats) containing the animals.

The entire lower cylinder is contained in a protecting box.

The atomizer is placed at the upper end of the top cylinder, while the lower cylinder contains a cascade impactor, a hygrometer, a flow-meter and a vacuum pump which extracts the air from the entire apparatus at a rate of approximately 13 litres per minute; the exiting aerosol is neutralized by being passed through a 10 per cent solution of sodium hydroxide with 0.5 per cent hydrogen peroxide and a final filter.