40 C.F.R. § 796.1950

Vapor pressure.

(a) *Introduction* — (1) *Background and purpose.* (i) Volatilization, the evaporative loss of a chemical, depends upon the vapor pressure of chemical and on environmental conditions which influence diffusion from a surface. Volatilization is an important source of material for airborne transport and may lead to the distribution of a chemical over wide areas and into bodies of water far from the site of release. Vapor pressure values provide indications of the tendency of pure substances to vaporize in an unperturbed situation, and thus provide a method for ranking the relative volatilities of chemicals. Vapor pressure data combined with water solubility data permit the calculation of Henry's law constant, a parameter essential to the calculation of volatility from water.

(ii) Chemicals with relatively low vapor pressures, high adsorptivity onto solids, or high solubility in water are less likely to vaporize and become airborne than chemicals with high vapor pressures or with low water solubility or low adsorptivity to solids and sediments. In addition, chemicals that are likely to be gases at ambient temperatures and which have low water solubility and low adsorptive tendencies are less likely to transport and persist in soils and water. Such chemicals are less likely to biodegrade or hydrolyze and are prime candidates for atmospheric oxidation and photolysis (e.g., smog formation or stratospheric alterations). On the other hand, nonvolatile chemicals are less frequently involved in atmosphere transport, so that concerns regarding them should focus on soils and water.

(iii) Vapor pressure data are an important consideration in the design of other chemical fate and effects tests; for example, in preventing or accounting for the loss of violatile chemicals during the course of the test.

(2) *Definitions and units.* (i) "Desorption efficiency" of a particular compound applied to a sorbent and subsequently extracted with a solvent is the weight of the compound which can be recovered from the sorbent divided by the weight of the compound originally sorbed.

(ii) "Pascal" (Pa) is the standard international unit of vapor pressure and is defined as newtons per square meter (N/m). A newton is the force necessary to give acceleration of one meter per second squared to one kilogram of mass.

(iii) The "torr" is a unit of pressure which equals 133.3 pascals or 1 mm Hg at 0 °C.

(iv) "Vapor pressure" is the pressure at which a liquid or solid is in equilibrium with its vapor at a given temperature.

(v) "Volatilization" is the loss of a substance to the air from a surface or from solution by evaporation.

(3) *Principle of the test methods.* (i) The isoteniscope procedure uses a standardized technique [ASTM 1978] that was developed to measure the vapor pressure of certain liquid hydrocarbons. The sample is purified within the equipment by removing dissolved and entrained gases until the measured vapor pressure is constant, a process called "degassing." Impurities more volatile than the sample will tend to increase the observed vapor pressure

and thus must be minimized or removed. Results are subject to only slight error for samples containing nonvolatile impurities.

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