The residence time of deposited, inhaled, small radioactive particles, and hence the dose to the lung, depend on the rate of dissolution of the particles in the environment of the lung. The problem of estimating rate of dissolution of inhaled radioactive aerosols in the lung is identified and discussed from the point of view of a Health Physicist.

After the deposition of inhaled radioactive particles in the respiratory tract, it may be important to estimate the rate at which the particles will dissolve in the deep lung. Particles that are not removed by ciliary action may remain for long periods in the deep lung. If the particles are relatively insoluble in the lung environment, the dose to the lung may be quite large. A decision to perform lung lavage or to institute chelation therapy may rest on an estimate of the rate of dissolution of the deposited particles.

Unfortunately, the means for performing a rigorous laboratory dissolution study are not always readily available to a Health Physicist. Recommendations for performing an in vitro dissolution study on an aerosol field sample, using equipment, materials and chemicals available to the standard radiological laboratory are presented.

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