

Exercise

Master's degree in environmental science and engineering

Occupational and environmental health

5.1 Physico-chemical - properties

1) Falling speed limit

What is the sedimentation rate in cm per hour of quartz particles with an average physical diameter of $1.75\mu\text{m}$ and a density of 2.65 ?

2) And... another story of a fall

A quartz particle (aerodynamic diameter: $1.75\mu\text{m}$) and a glycol ether droplet (physical diameter: $3\mu\text{m}$) are emitted 1 meter above the ground. The Quartz particle reaches the ground first, explain why ?

M: 90.1 [g/mol], D: 8.10^{-6} [m^2/s], P_s : 1.4 [kPa], ρ : 0.9 [g/cm^3] for glycol ether.

3) Inhalable fraction

Explain why it is useful to define conventions for particle size fractions in relation to their penetration into the respiratory system.