Answer on Question # 37144

Physics – Mechanics | Kinematics | Dynamics

Question:

A Spring balance reads 200g when carrying a lump of lead in air .if the lead is now immersed with half of its volume in brine solution ,what will be the new reading of the spring balance specfic gravity of lead and brine are 11.4 and 1.1 respectively

Solution:

Weight of a lump in air is

$$P_1 = mg.$$

Volume of a lump is $V = m/\rho_l$.

Using the Archimedes principle we can write a weight of a lump in a brine solution as follows:

$$P_2 = m'g = mg - \frac{\rho g V}{2} = mg\left(1 - \frac{\rho}{\rho_l}\right),$$

where m' corresponds to the new readings of the spring balance. So,

$$m' = m\left(1 - \frac{\rho}{\rho_l}\right) = 200 \cdot \left(1 - \frac{1.1}{11.4}\right) = 181\ g.$$

Answer:

$181\ g$