P #37

Ch 9 - pg 297

$m_{Shell} = .400\ kg$

$r_{Shell} = \frac{.200\ m}{2} = .100\ m$

$\rho_{Al} = 806\ kg/m^3$

Find Volume:

$V = 4/3 \cdot \pi \cdot r^3$

$= 4/3 \cdot \pi \cdot (.100\ m)^3$

$V_{Shell} = 4.189 \times 10^{-3}\ m^3$

Find alcohol mass:

$\rho_{al} = \frac{m_{al}}{V_{al}}$ so $806\ kg/m^3 = \frac{m_{al}}{(4.189 \times 10^{-3}\ m^3)}$

$m_{Al} = 3.38\ kg$

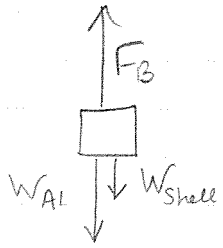
Find F_B:

$F_B = \rho \cdot g \cdot V$

$= (1000\ kg/m^3)(9.8\ m/s^2)(4.189 \times 10^{-3}\ m^3)$

$F_B = 41.05\ N$

Find a:



$F_B = 41.05\ N$

$W_{Al} = m \cdot g = (3.38\ kg)(9.8\ m/s^2)$

$W_{Al} = 33.09\ N$

$W_{Shell} = m \cdot g = (.400\ kg)(9.8\ m/s^2)$

$W_{Shell} = 3.92\ N$

$F_{net} = m \cdot a$

$(41.05 - 33.09 - 3.92\ N) = (3.38 + .4\ kg) \cdot a$

$a = 1.07\ m/s^2$