A piece of plastic barely floats in water if it has a mass of 20g, what is its volume

Solution:

$m = 20g$ — mass of the piece of plastic;

$\rho = 1\dfrac{g}{cm^3}$ — water density;

F_a — Archimedes force;

V — volume of the piece of plastic.

Newton's second law for the piece of plastic on Y-axis:

$mg - F_a = 0$

$mg = F_a$ (1)

$F_a = \rho g V$ (2)

$(2)in(1):$

$mg - \rho g V = 0$

$\rho g V = mg$

$V = \dfrac{m}{\rho} = \dfrac{20g}{1\dfrac{g}{cm^3}} = 20\ cm^3$

Answer: volume of the piece of plastic is $20\ cm^3$