Task #81388

How many water molecules are in the graduated cylinder? 100mL graduated cylinder with 35mL of water? Show all work.

Solution.

$m = \rho * V$, ρ – density of water(1 g/cm^3), V – volume(35 mL = 35 cm^3)

$m = 35\ cm^3 * 1\ g/cm^3 = 35\ g$

$n = m(H_2O)/M(H_2O)$, $M(H_2O) = 18$ g/mole

$n = N/N_a$, N_a - constant Avogadro($6{,}022 * 10^{23}$ $mole^{-1}$).

$N = m(H_2O)*N_a/M(H_2O)$

$N = (35*6.022*10^{23})/18 = 1.171 * 10^{24}$ molecules

Answer:

$N = 1.171 * 10^{24}$ molecules