Answer on Question #80759, Chemistry / General Chemistry

If 12g of sodium hydroxide was dissolved in 100cm3 of water.
What would be the concentration in mol /dm3, of the solution?

Solution

n=m/M

M(NaOH)= 40 g/mol

$$n(NaOH) = \frac{12\ g}{40\ \frac{g}{mol}} = 0.3\ mol$$

$$c = \frac{n}{V}$$

$m_{solution}$ = m(NaOH) + m(H_2O)= m(NaOH)+V(H_2O)×d(H_2O)= 12 g+ 100 cm^3×1g/cm^3 = 112 g

We make an assumption that solution of NaOH has density the same as water, $d_{solution}$ = 1g/cm^3

V=m×d

$V_{solution}$ =112 g×1g/cm^3 = 112 cm^3

$$c = \frac{0.3\ mol}{112\ cm^3 \times \frac{1\ dm^3}{1000\ cm^3}} = 2.7\ moi/dm^3$$

Answer: 2.7 mol/dm^3