

Answer on the question #47054, Chemistry, Physical Chemistry

Question

give molarity and strength %W/V accordingly in 30volume of H₂O₂ solution.
(Answer me with method.)

Answer

30volume solution means that:

$$\varphi(H_2O_2) = \frac{V(H_2O_2)}{V(H_2O_2) + V(H_2O)} * 100\% = 30\%$$

The molarity of the solution is:

$$C = \frac{n(H_2O_2)}{V(solution)}$$

The volume of H₂O₂ is connected with its n:

$$n = V(H_2O_2) * \frac{\rho(H_2O_2)}{M(H_2O_2)} = V(H_2O_2) * \frac{1.450 * 10^3}{34.015}$$

Let's make a suggestion that $V(solution) = V(H_2O_2) + V(H_2O)$. Then:

$$C = \frac{n(H_2O_2)}{V(solution)} = \frac{V(H_2O_2)}{V(solution)} * \frac{1.450 * 10^3}{34.015} = \frac{\varphi(H_2O_2)}{100\%} * \frac{1.450 * 10^3}{34.015} = 12.8 \frac{mol}{L}$$

The strength of the solution is:

$$Strength = \frac{m(H_2O_2)}{V(solution)} = C * M(H_2O_2) = 12.8 * 34.015 = 435.4 \text{ g/L}$$