

Task:

if 0.5M H₂SO₄ contains 50mL then 1M H₂SO₄ contains how much mL?

Solution:

The number of moles of H₂SO₄ doesn't change in both cases.

$$n(\text{mol}) = C(\text{M}) \cdot V(\text{L})$$

According to the equation $n_1 = n_2$, we can write the following:

$$C_1(\text{M}) \cdot V_1(\text{L}) = C_2(\text{M}) \cdot V_2(\text{L})$$

The volume of 1M solution is

$$V_1(\text{L}) = C_2(\text{M}) \cdot V_2(\text{L}) / C_1(\text{M})$$

$$V_1(\text{mL}) = 0.5 \cdot 50 / 1 = 25 \text{ mL}$$

Answer: $V_1(\text{mL}) = 25 \text{ mL}$