

Answer on Question #48803, Chemistry, Other

Task:

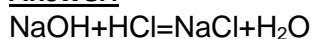
Calculate the volume of a 0.500 M NaOH solution needed to neutralize (titrate to the endpoint):

a) 10.0 mL 0.300M HCl

b) 10.0 mL 0.200M H₂SO₄

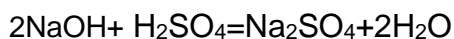
c) 4.08 g KHP (molar mass 204 g/mol)

Answer:



$$C_M(\text{NaOH}) \cdot V(\text{NaOH}) = C_M(\text{HCl}) \cdot V(\text{HCl})$$

$$V(\text{NaOH}) = \frac{0,300 \cdot 10,0}{0,500} = 6,00 \text{ ml}$$

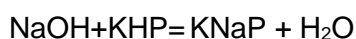


$$2v(\text{NaOH}) = v(\text{Na}_2\text{SO}_4)$$

$$v(\text{NaOH}) = \frac{v(\text{Na}_2\text{SO}_4)}{2}$$

$$C_M(\text{NaOH}) \cdot V(\text{NaOH}) = \frac{C_M(\text{Na}_2\text{SO}_4) \cdot V(\text{Na}_2\text{SO}_4)}{2}$$

$$V(\text{NaOH}) = \frac{0,200 \cdot 10,0}{2 \cdot 0,500} = 2 \text{ ml}$$



$$v(\text{NaOH}) = \frac{m(\text{NaOH})}{M((\text{NaOH}))}$$

$$v(\text{NaOH}) = v(\text{KNaP})$$

$$v(\text{NaOH}) = \frac{4,08}{204} = 0,02 \text{ mol}$$

$$C_M(\text{NaOH}) \cdot V(\text{NaOH}) = v(\text{NaOH})$$

$$V(\text{NaOH}) = \frac{v(\text{NaOH})}{C_M(\text{NaOH})} = \frac{0,02}{0,500} = 0,04 \text{ ml}$$