

KEY

- b) What volume of 0.1M HCl would be needed for the neutralization in (a)?
(2 marks)

2
 $\text{mol NaOH} = 0.2\text{M} \times 0.0500\text{ L} = 0.01\text{mol NaOH}$ $\rightarrow L_{\text{HCl}} = \frac{\text{mol}}{\text{M}} = \frac{0.01\text{mol}}{0.1\text{M}} = 0.1\text{L} = 100\text{mL}$
 $\boxed{\text{NaOH} + \text{HCl} \rightarrow \text{H}_2\text{O} + \text{NaCl}}$
 $\text{mol HCl} = 0.01\text{mol NaOH} \times \frac{1\text{mol HCl}}{1\text{mol NaOH}} = 0.01\text{mol HCl}$ Answer 100 mL

- c) Which beaker would require the least volume of 0.1M HCl for complete neutralization? #3 (kOH) (1 mark)

- d) What volume of 0.1M HCl would be needed for the neutralization in (c)?
(2 marks)

2
 $\text{mol KOH} = 0.05\text{M} \times 0.0200\text{ L} = 0.001\text{ mol KOH}$
 $\boxed{\text{KOH} + \text{HCl} \rightarrow \text{H}_2\text{O} + \text{KCl}}$
 $\text{mol HCl} = 0.001\text{ mol KOH} \times \frac{1\text{mol HCl}}{1\text{mol KOH}} = 0.001\text{ mol HCl}$
 $L_{\text{HCl}} = \frac{\text{mol}}{\text{M}} = \frac{0.001\text{mol}}{0.1\text{M}} = 0.01\text{L} = 10\text{mL}$ Answer 10 mL

25. Calculate the mass of NaOH which is required to neutralize 15.00 mL of 0.350 M H_2SO_4 ? (3 marks)

3
 $\text{mol H}_2\text{SO}_4 = 0.350\text{M} \times 0.01500\text{L} = 0.00525\text{ mol H}_2\text{SO}_4$
 $\boxed{\text{H}_2\text{SO}_4 + 2\text{NaOH} \rightarrow 2\text{H}_2\text{O} + \text{Na}_2\text{SO}_4}$

MASS NaOH

$$0.00525\text{ mol H}_2\text{SO}_4 \times \frac{2\text{ mol NaOH}}{1\text{ mol H}_2\text{SO}_4} \times \frac{40.0\text{ g NaOH}}{1\text{ mol NaOH}} = 0.420\text{ g}$$

(0.0105 mol) Answer 0.420 grams

- 1 26. When a 0.1 M strong base titrates a 0.1 M weak monoprotic acid, it takes (less/more/the same) the same volume of the base as it would to titrate a 0.1 M strong monoprotic acid. (1 mark)

9