

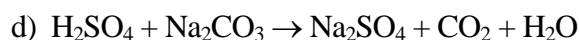
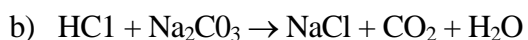
Titration calculations for pleasure and profit

Moles over voles stuff

1. Calculate the amount of hydrochloric acid in 25cm^3 of 0.100M HCl .
2. Calculate the amount of sodium hydroxide in 250cm^3 of 0.2M NaOH .
3. Calculate the M_r of sodium hydroxide and the M_r of sodium carbonate, Na_2CO_3 .
4. a) What mass of sodium hydroxide must be dissolved in 250cm^3 of water to make a 0.5M solution?
b) What amount of sodium hydroxide is there in 25cm^3 of this solution?
5. a) What mass of sodium carbonate must be dissolved in 250cm^3 of water to make a 0.25M solution?
b) What amount of sodium carbonate is there in 50cm^3 of this solution?

Equation stuff

6. Balance these equations:



Beautiful burette stuff

Show your working out, and show your answers to the appropriate number of significant figures.

7. 25.00cm^3 of 0.100M NaOH is needed to titrate 25.00cm^3 of a solution of hydrochloric acid. Calculate the concentration of the acid.
8. 23.15cm^3 of 0.125M NaOH is needed to titrate 25.00cm^3 of a solution of hydrochloric acid. Calculate the concentration of the acid.
9. 25.00cm^3 of 0.200M NaOH is needed to titrate 25.00cm^3 of a solution of sulphuric acid. Calculate the concentration of the acid.
10. 3.45g of an unknown acid, HX is dissolved in 250cm^3 of water in a standard flask. 25cm^3 of this solution was pipetted into a conical flask. 24.00cm^3 of 0.400M NaOH was needed to titrate it.
 - a) What is the amount of sodium hydroxide in 24.00cm^3 of 0.400M sodium hydroxide?
 - b) Taking into account the stoichiometry between HX and sodium hydroxide, what the amount of HX in the 25cm^3 aliquot?
 - c) What is the total amount of HX in the original 250cm^3 solution?
 - d) Using your answer to part (c), and the mass given in the question, calculate the M_r of HX .
 - e) If X is a halogen, what is the most likely identity of HX ?
 - f) Estimate the maximum errors in the using each piece of apparatus and the total apparatus error. How confident are you that you have correctly identified HX ?