Test

Environment, Water

Experiment 5 Title: Volumetric Analysis — stoichiometry Purpose: To determine the exact concentration of a monobasic acid, HX (KA1) Materials and apparatus: 1.   Volumetric flask and stopper (250cm3) 2.   Electric balance ±0. 01 g 3.   Pipette and pipette filler (25cm3) 4.   Volumetric flask and stopper (100cm3) 5.   Burettes (50cm3) 6.   Retort stand and clamp 7.   White tile 8.   Wash bottle filled with distilled water 9.   Spatula 10.   Titration flasks 11.   Glass rod 12.   Filter funnel 13.   Beaker (80cm3) 14.   Beaker (250cm3) 15.   KA1 (monobasic acid, HX) 16.   Methyl orange as indicator 17.   Solid sodium carbonate 18. Distilled water Theory: To determine the exact concentration of a monobasic acid, HX, a standard base solution is prepared. Then, a certain amount of standard base solution is titrated with the monobasic acid. This is an acid-base titration. The equation for the reaction is $Na_2CO_3(aq) + 2HX(aq) \rightarrow 2NaX(aq) + H_2O(l) + CO_2(g)$ Procedure: 1.   Weight accurately about 13. 20-13. 50g of solid sodium carbonate in a small beaker. Dissolve this in the beaker. Transfer the solution and washing into a 250cm3 standard flask and make up to the mark with distilled water. Shake well. 2.   Pipette 25. 0 cm3 of the standard solution of sodium carbonate into a conical flask. Add two or three drops of methyl orange indicator and titre this solution with KA1. Readings are recorded in the table. The titration is repeated three times to achieve accurate results. Results: Titration number | Rough | Accurate | | | 1 | 2 | 3 | Final reading/cm3 | | | | | | Initial reading/cm3 | | | | | | Volume of KA1/cm3 | | | | | | Mass of beaker + sodium carbonate= _____ Mass of empty beaker   = _____ Mass of sodium carbonate

= _____ Calculation: 1.   25. 0 cm3 of standard solution of sodium carbonate required _____ of KA1 for complete reaction. 2. Average titre value = 3.   Calculate the concentration of sodium carbonate.

4.   Calculate the concentration of the monobasic acid, HX in KA1.

= _____ Calculation: 1.   25. 0 cm3 of standard solution of