Titration of a strong acid report examples

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- The location of the equivalence point on the graph

An equivalence volume for the reaction can be determined using the point in the graph with the greatest slope (Clark, 2002). This point was between 14mL and 16mL of NaOH. The equivalence point is determined by the midpoint between the two points, which is 15 mL.

- The volume of NaOH added at the endpoint of the titration for the first trial

- The volume of NaOH added at the endpoint of the titration for the second trial.

The volume of NaOH that was added by the time the titration reached the endpoint was 15. 003mL.

- The volume of NaOH added at the equivalence point.

For the first trial, the volume of NaOH that was added after reaching the equivalence point was 1mL while, in the second trial, the volume added was 0. 003mL.

- The pH at the half-equivalence point.

The volume of NaOH added at the half-equivalence point was 7. 5mL. From the curve, this point corresponds to pH of 0. 63 and thus the pH at the half-equivalence point was 0. 63.

- Calculate the molarity of the HCl from the volumes of acid and base at the equivalence point and the molarity of the NaOH. Show your calculations.

The equation of the reaction between the HCL and NaOH may be writen as shown below

HCl + NaOH →NaCl + H2O

The moles of NaOH at the equivalence point were

Molarity= MolesVolume in Litres

moles= Volume in Litres×Molarity

= 151000×1

= 0. 015 moles

Since equal moles of the acid reacted with equal moles of the base, the moles of the HCL were 0. 015 moles. Therefore, with the used volume of 25mL that was added in the Erlenmeyer flask,

Molarity= MolesVolume in Litres

Molarity= 0. 0150. 025

0. 6 M

- Include a section in which you do the following:

- Compare how readily the H+ disassociates in HCl versus acetic acid.

HCl is a strong acid and have a strong dissociation capability increasing the hydrogen ion concentration in a solution. In most cases, the efficiency of the dissociation is 100% when in solution. Acetic acid, which is a weak acid, has only a small fraction dissociating in most solutions.

- Explain how this is related to the equilibrium position (relative amounts of product and reactant) of the reactions.

The fact that strong acid undergo 100% ionization keeps the equilibrium always inclined to the right and at no point is the equilibrium shifted to the left. On the other hand since the ionization of a weak acid is less than 100%, the equilibrium position is always dependent on the equilibrium constant also known as the Ka of the acid (Potts, 2001).

- After completing the steps for titrating an acid with a base, explain why it is important to follow the steps precisely.

The titration technique involves a number of steps and following these steps with precision is one way of ensuring that the right results are obtained. The procedure also involves changes in color which takes place at a very particular point and thus precision is required when carrying out the experiment. This is shown by the fact that 1mL of NaOH was added after the equivalence point, whereas only 0. 003mL was needed to attain the end point. This error would have been carried forward resulting to the high experimental error.

Reference List

Clark, J. (2002). pH (TITRATION) CURVES. Retrieved March 30, 2013, from http://www. chemguide. co. uk/physical/acidbaseeqia/phcurves. html

Potts, G. E. (2001). Autoionization of Water. Retrieved March 29, 2013, from http://www. utc. edu/Faculty/Gretchen-Potts/chemistryhelp/acidbase. htm