2001 HIGHER SCHOOL CERTIFICATE EXAMINATION

Chemistry

Section I – Part B (continued)

Marks

Question 19 (7 marks)

Name ONE type of cell, other than the dry cell or lead–acid cell, you have studied. Evaluate it in comparison with either the dry cell or lead–acid cell, in terms of chemistry and the impact on society. Include relevant chemical equations in your answer. **7**

The button cell is an example of a cell we have studied. The button cell has had a large effect on society, due to its use in devices such as pacemakers. The button cell has saved more lifes, and improved society more so in that respect.

Chemically, the button cell is less dangerous, as it does not contain lead.

Marks

Question 20 (4 marks)

A 0.1 mol L^{-1} solution of hydrochloric acid has a pH of 1.0, whereas a 0.1 mol L^{-1} solution of citric acid has a pH of 1.6.

(a) State ONE way in which pH can be measured. **1**

It can be measured by a pH meter.

(b) Explain why the two solutions have different pH values. **3**

The two solutions have different pH values because the number of the hydronium ions, the protons present in the HCl is more that the hydronium ions present in the citrus acid.
The degree in the number of the varying ions determine their pH level and signifies that HCl, due to more H^+ ions present, its more acidic than citrus acid.

Marks

Question 21 (4 marks)

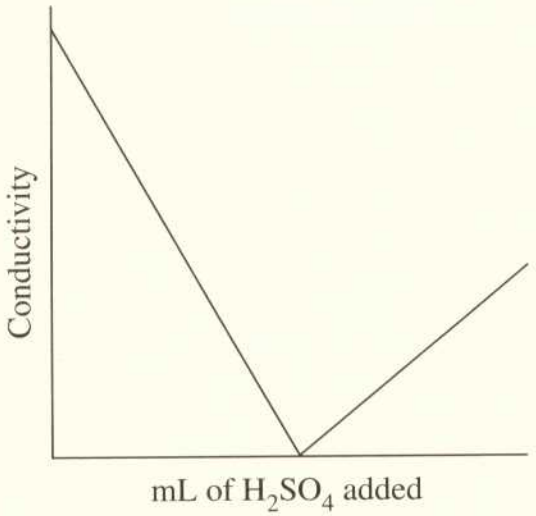
Barium hydroxide and sulfuric acid react according to the following equation:

$$Ba(OH)_2(aq) + H_2SO_4(aq) \rightarrow BaSO_4(s) + 2H_2O(l)$$

(a) Name this type of chemical reaction. **1**

Neutralisation Acid + Base = Salt + Water

(b) A 20 mL sample of barium hydroxide was titrated with 0.12 mol L^{-1} sulfuric acid. The conductivity of the solution was measured throughout the titration and the results graphed, as shown. **3**



Explain the changes in conductivity shown by the graph.

As H_2SO_4 was added the Solution gradually became neutral at the neutralisation point which is when the conductivity is 0. As the solution becomes more basic the Conductivity increases, but at a slower rate to which when the solution was Acidic.