GATITU DAY MIXED SEC SCHOOL

CHEMISTRY FORM FOUR

TERM 2 2012 C.A.T 1

1 HOUR

1. In an experiment to determine the molar heat of solution of sulphuric (VI) acid, 2cm3 of sulphuric acid was carefully dissolved in 98cm3 of water and the following results were obtained.

Final temperature of the solution 23.0 c0

Initial temperatureof the solution 27.5 c0

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45 c0

A. State whether the change is exothermic or endothermic

Explain your answer (2mks)

B. Calculate the enthalpy change in this experiment (3mks)

C. Given that the acid was 98% pure and that its specific density is 1.89g/cm3, calculate the mass of the acid. (3mks)

D.Calculate the molar heat of solution for sulphuric acid (2mks)

2. The amount of sulphuric (IV) acid that can dissolve in water at different temperatures is shown in the table below

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Temperatures c0 | 5 | 10 | 20 | 25 | 35 | 50 | 56 |
| Solubility of S02 | 190 | 154 | 107 | 90 | 67 | 42 | 35 |

A. Plot the graph of mass of S02  against temperature (5mks)

B. From the graph, determine

I.the mass of So2 that would dissolve in one litre of solution at 20 c0. (1mk)

Ii.The temperature at which a litre of solution contains 40 g of sulphur (IV) oxide (1mk)

iii. Calculate the molarities of the solution at 50 c0 (3mks)

3. Excess carbon ii oxide was passed over a heated sample of an oxide of Iron as shown in the diagram below

Dry carbon ii oxide

Fumed

Cupboard

Mass of empty dish=10.98g

Mass of empty dish +an oxide of iron =13.30 g

Mass of empty dish +residue =12.66g

I.Determine the formula of the oxide of Iron (Fe =56 O= 16) (3mks)

Ii.Write an equation for the reaction which took place in the dish. (2mks)

4. Corrosion is destructive process in which Iron is converted to hydrated Iron iii oxide

State (i) two conditions necessary for rusting (2mks)

ii) One method of preventing rusting (1mk)

b. Explain why it is not advisable to clean Iron taxis using sea water (2mks)