En2

Title: Enthalpy Studies of Hydrogen Bonding

Experiment 1

Objective: To discover the existence of hydrogen bonds between enthanol
molecules

Result:

Initial temperature reading: 26.5 ℃

Final temperature reading: 24.5 ℃

Questions:
1. The mixing process is endothermic, because since there is a
temperature drop, therefore it means heat is absorbed by the solution.
There is a temperature change on mixing two liquids, because energy
is required to break the bonds.

Experiment 2

Objective: To measure the strength of hydrogen bond formed between
ethanol

Result:

Initial temperature change: 25.5 ℃

Final temperature change : 23.0 ℃

Calculations:

$$Q = -\Sigma Cp \bullet m \bullet \triangle T$$

$$=$$
$$=$$

Question
1. Hexane has to be used in excess, because it is to ensure that all the ethanol is being reacted, so that the result will be accurate.
2. The value is not reliable. Since there may be heat loss to the surrounding, so that the result may not be accurate. Also,we may not take the highest temperature rise from the thermometer, this will also affect the result of the reaction.

Experiment 3

Objective: To discover the formation of hydrogen bod between molecules of propanone and trichoromethane

Result:

Initial temperature change: 25.0 ℃

Final temperature change : 32.0 ℃

Question
1. The mixing process is exothermic, because since there is an increase in temperature during the reaction, therefore heat is released to the surrounding.

2. In an exothermic reaction, the energy required in bond breaking in the reactant is smaller than the energy released in new bond formation. The enthalpy or the product is less than that of the reactants. Therefore energy is given out to the surrounding as heat.

Experiment 4

Objective: To estimate a value for the strength of hydrogen bond between
Propanone and trichloromethane

Result:

Initial temperature change: 25.0 ℃

Final temperature change : 33.0 ℃

Calculation:

$Q = -\Sigma\, Cp \bullet m \bullet \triangle T$

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