Student Essay on Heat Energy Required for the Dissolution of Naoh

Heat Energy Required for the Dissolution of Naoh by Bill Buford

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Essay

Aim :-]

To calculate the energy needed to dissolve a particular amount of NaOH and to calculate the heat per mole.

Equipment :-]

Polystyrene cup, watch glass, stirring rod, 100 ml of water, thermometer, beaker, approximately 8 grams of NaOH and a measuring scale.

Method :-]

Weigh out and record the mass of the NaOH using the scale. Do not place the NaOH directly onto the scale, instead place on a watch glass. Make sure you are not including the weight of the watch glass in your calculations.

Fill the polystyrene cup with 100 ml of water, transferred from your beaker.

Note the initial temperature of the water.

Place the NaOH flakes into the cup and stir with the stirring rod to aid the dissolution process.

Record the final temperature after all the NaOH has dissolved.

Note - the reaction is an exothermic one.

Risk Assessment :-]

Be careful, glove and goggles should be worn along with other protective clothing as NaOH (and NH4NO3) are both caustic (damages skin tissues and eyes).

Avoid excessive splashing onto clothes, skin and into eyes.

Rinse immediately with water if one becomes contaminated.

Results :-]

The initial temperature of the water was 22,,aC.

The final temperature of the water after the reaction (the NaOH fully dissolved) was 42,,aC which makes £GT = 42 - 22 = 20,,aC

The C is 4.18 and the mass is 100 grams.

Therefore using the formula - J = MC£GT one can figure out the joules required.

Joules is equal to 4.2 22 100 = 9.24 Kj. So if 9.24 joules are need to heat up 0.2 moles then 9.24 5 grams will be needed to heat up 1 mole. Therefore the heat per mole is 26.2 Kj / mole

Note that 0.2 moles of NaOH was used ¡K because

n = g / FM (g is equal to 8 and FM is equal to 23 + 16 + 1 = 40)