1. WHICH HAS THE LARGER VALUE ON A MOLAR BASIS, HEAT OF FUSION OR HEAT OF VAPORIZATION?

Heat of Vaporization

1. WOULD 20.0 g OF STEAM AT 100OC BE ENOUGH TO MELT 20.0 g OF ICE AT 0OC? EXPLAIN.

Yes.

Mass of ice (mi) = 20g 🡪 .02kg

Latent heat of ice (Li) = 333,000 J/kj

Total heat for melting ice (Qi) = mi\*Li = 6,660J

Mass of steam (ms) = 20g 🡪 .02kg

Latent heat of steam (Ls) = 2,256,000 J/kg

Total heat from steam (Qs) = ms\*Ls = 45,120J

heat from steam > heat needed to melt ice

1. IN BOTH CASES THE ENTHALPY VALUE CALCULATED FROM THE WATER DOES NOT AGREE WITH THE VALUE CALCULATED FROM EITHER THE ICE OR STEAM. WHY?

To obtain the enthalpy value for either ice or steam, the heat is calculated first. Different masses, temperature changes and moles will affect the different numbers.

1. HOW DOES YOUR Hfusion COMPARE TO THE LITERATURE VALUE?

My Hfusion: 2.38kJ/mol

Literature Value: 6.01kJ/mol

http://chemed.chem.wisc.edu/chempaths/GenChem-Textbook/Enthalpy-of-Fusion-and-Enthalpy-of-Vaporization-842.html

1. HOW DOES YOUR Hvaporization COMPARE TO THE LITERATURE VALUE?

My Hvaporization : 38.6kJ/mol

Literature Value: 40.67kJ/mol

http://chemed.chem.wisc.edu/chempaths/GenChem-Textbook/Enthalpy-of-Fusion-and-Enthalpy-of-Vaporization-842.html

1. WHICH WOULD PRODUCE A MORE SEVERE BURN, BOILING WATER OR STEAM AT 100OC? EXPLAIN

Steam. Steam and water are both at 100oC but they both give off different energy speeds. The state of the gas turning back to a liquid when it reaches your skin is the reason. The molecules of the steam are constantly moving fast. When it touches your skin it goes from a high movement energy to a low movement energy. The heat is being lost in transition from high to low or gas to liquid. As a result of the state change (gas to liquid) the change is exothermic (heat is given off). So although the temperature of boiling water and steam are the same, the state change from steam to water on your skin is an exothermic reaction, releasing more heat then the desired 100oC. Thus retrieving a more serious burn than boiling water.