ΔH and q=ms ΔT problems

1. The substance cyclohexane, C_6H_{12} , has the following physical properties:

melting point	$= 6.0 ^{\circ}C$	$S_{(solid)} = 1.2 \text{ J/g}^{\circ}\text{C}$	ΔH_{fusion} = 2.4 kJ/mol
boiling point	= 81.0°C	$S_{(liquid)} = 2.8 \text{ J/g}^{\circ}\text{C}$	ΔH_{vap} = 18.0 kJ/mol
		$S_{(gas)} = 0.9 J/g^{\circ}C$	

Calculate the heat change needed to do the following, and indicate whether the process is exothermic or endothermic:

- a) melt 100g of solid C_6H_{12} at it's melting point.
- b) boil 100g of liquid C_6H_{12} at it's boiling point.
- c) freeze 25g of liquid C_6H_{12} at its melting point.
- d) condense 50g of C_6H_{12} vapor at its boiling point.
- e) heat 10g of C_6H_{12} from 2°C to 5°C.
- f) heat 20g of C_6H_{12} from 20°C to 50°C.

2. Given the following data for H_2O

normal melting point: 0°C normal boiling point: 100°C Heat of fusion: 6.0 kJ/mol Heat of vaporization: 44 kJ/mol Specific heat of liquid: 4.184 J/g°C Specific heat of gas: 2.0 J/g°C Specific heat of solid: 2.1 J/g°C

Calculate the heat change needed to do the following, and indicate whether the process is exothermic or endothermic:

a) melt 100g of solid H₂O at it's melting point.

b) boil 100g of liquid H_2O at it's boiling point.

c) freeze 25g of liquid H_2O at its melting point.

- d) condense 50g of H₂O vapor at its boiling point.
- e) heat 35g of H_2O from 25°C to 85°C.
- f) heat 235g of H_2O from -25°C to -5°C.