HEAT PROBLEMS

Use the following information to answer the questions as needed

Heat capacity of water: 1 cal/gC   ice: 0.5 cal/gC   steam: 0.5 cal/gC

Heat of fusion: 80 cal/g   Heat of vaporization: 540 cal/g

1. What quantity of heat is necessary to raise the temp. of 25 grams of ice from -15 to 125 C?

A: 18500 cal

2. How much heat is required to change a 15 gram piece of ice at -20C to water at 5 C?

A: 1425 cal

3. What quantity of heat is needed to change 50 g of water from 25 C completely to steam?

A: 30,750 cal

4. Which of the following would you expect to be a larger number: heat of fusion or heat of vaporization? Why?

5. A piece of metal at 100 C is placed in 75 grams of water at 25 C. The water temp. raises to 30 C. Assuming that the Cp of the metal is .2 cal/gC, what is the mass of the metal? (heat gained = heat lost)

A: 26.7 g

6. 50.0 grams of water are raised from 20.0 to 35.0 C when a 5 gram potato chip is burned under the can. How many calories per gram are in the chip?

A: 150 cal/g

7. Substance X has a boiling point of 60.0 C and a freezing point of 40.0 C. Given that substance X has a heat capacity of **.35** cal/gC, **.55** cal/gC, and **.25** cal/gC in the solid, liquid and gaseous states of matter,how many calories of energy would be necessary to raise thetemperature of 15 grams of substance X from 25 C to 80.0 C?Substance X has a heat of fusion of **40.0** cal/g and a heat of vaporization of **275** cal/g.

A: 5043 Cal

8. What quantity of heat is required to heat a one liter bottle of soda from 25 C to 100 C? The density of water is 1 g/ml.

A: 75000 cal

9. To what temperature could the energy inside a Snickers bars (250,000 calories) raise a 500 ml bottle of water? The density of water is 1 g/ml. Assume the water starts at 25 C.

10. What mass of ice would be necessary to cool a 500.0 ml glass of water from 25 C to 5 C?