

Name: _____ Per _____

Heating, Cooling, and Phase Changes

Practice Sheet #47

Give the equation used to solve each problem and answer with the appropriate units.

(1) How much heat is released when 20.0 g of liquid water freezes?

(2) How much heat is required to boil 75.00 g of water?

(3) How much heat is required to increase the temperature of 200 g of aluminum by 10.0 °C?

(4) How much heat is required to increase the temperature of 30.0 g of copper from 20.0 °C to 60.0 °C?

(5) What mass of ethanol (C₂H₆O) can be boiled with 2.93x10⁴ J of heat energy? How many moles is this?

(6) What mass of iron can be heated from 100.0 °C to 150.0 °C with 3375 J of heat energy? How many moles is this?

(7) What mass of gold can be heated from 500 °C to 800 °C with 7.80 kJ of heat energy? How many moles is this?

(8) How much heat is released when 2.00 kg of aluminum solidifies? How many kJ is this?

Name: _____ Per _____

(9) What mass of acetic acid ($\text{HC}_2\text{H}_3\text{O}_2$) can be condensed with 7.9×10^3 J of heat energy? How many moles is this?

(10) How much heat is required to boil 260 g of liquid mercury? How many kJ is this?

(11) The temperature of a 20.0 g sample of iron is raised by adding 135 J of heat. If the initial temperature of the iron is 21.5°C , what is the final temperature?

(12) A 32.0 g sample of copper is cooled by releasing 156 J of heat. If the initial temperature of the copper is 45.2°C , what is the final temperature?

(13) If freezing 500 g of ammonia releases 1.66×10^5 J of heat energy, determine the heat of fusion for ammonia.

(14) If boiling 20.0 g of methanol requires 21600 J of heat energy, determine the heat of vaporization for methanol.

(15) A 15.0 g sample of manganese metal is warmed by adding 118.8 J of heat. If the temperature increases from 23.2°C to 39.7°C , what is the specific heat capacity of manganese?

Name: _____ Per _____

(16) A 25.0 g sample of tin metal is warmed by adding 201.5 J of heat. If the temperature increases from 24.8 °C to 55.8 °C, what is the specific heat capacity of tin?