

NAME

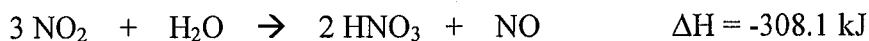
KEY

PERIOD

## Heat Practice Test

SHOW YOUR WORK!! CIRCLE YOUR FINAL ANSWER!!

1) Nitrogen dioxide ( $\text{NO}_2$ ) and water react with one another to form nitric acid ( $\text{HNO}_3$ ) and nitrogen monoxide ( $\text{NO}$ ) according to the following reaction.



A) Is this reaction an exothermic or endothermic reaction? How can you tell?

Exo

B) Would heat be a product or a reactant of this reaction?

Product

C) Would a thermometer read a temperature increase or decrease?

Increase

D) If 55.0 Liters of  $\text{NO}_2$  is used, how many kJ of heat will be produced from this reaction?

$$-252.16 \text{ kJ}$$

E) If 7.0 grams of  $\text{H}_2\text{O}$  react, how many kJ of heat will be produced from this reaction?

$$-119.82 \text{ kJ}$$

F) If all of this heat from PART E is used to warm up 380 grams of water at an initial temperature of  $20^\circ\text{C}$ , would the water begin to boil? Show your work. Don't forget to convert kJ to J!

$$\Delta T = 75.43^\circ\text{C}$$

$$T_f = 95.43^\circ\text{C}$$

No It  
Will Not

2) A 75.0 gram piece of nickel at  $25^\circ\text{C}$  is heated with 5.0 kJ of heat energy. What will be the final temperature of the nickel? ( $C_{\text{Nickel}} = .444 \text{ J/g}^\circ\text{C}$ )

$$\Delta T = 150.15^\circ\text{C} \quad T_f = 175.15^\circ\text{C}$$

3) A sample of ice with a mass of 25 grams is heated with 5.00 kJ of heat energy. Will all of the ice melt? (For ice  $H_f = 334 \text{ J/g}$ )

$$Q = H_f m \quad m = \frac{Q}{H_f}$$

$$m = 14.97 \text{ g}$$

$$Q = H_f m$$

$$Q = 334 \text{ J/g} (25 \text{ g})$$

$$Q = \cancel{8250 \text{ J}} 8.35 \text{ kJ}$$

No it  
will not  
all melt

4. Determine the amount of energy is required to raise the temperature of 50.8 grams of water from 35° Celsius to 92° Celsius.

$$Q = 12103.608 \text{ J}$$

5. If 50,500 J of heat is applied to a 5000 gram block of metal the temperature increases 22.5 degrees Celsius. Calculate the specific heat capacity of the metal. What is the metal?

$$.4488 \text{ J/g}^\circ\text{C}$$

IRON

6. Suzie conducts an experiment to determine the specific heat capacity of a sample of gold metal with a mass of 65 grams. She heats the gold in an oven to a temperature of 100°C. She quickly places the metal into a calorimeter (Styrofoam cup) containing 125 grams of water with a temperature of 22 °C. The temperature of the water rises to 23.2°C.

A) Determine the specific heat capacity of gold using Suzie's data

$$C = .1256 \text{ J/g}^\circ\text{C}$$

B) Calculate Suzie's percent error (the actual specific heat capacity of gold is 0.129 J/g°C.)

$$2.63\% \text{ Error}$$