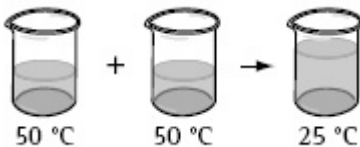


AST 5.1 (Heat Transfer) ____/ 16

____ 1. The chemical reaction shown in the illustration is an _____.



- A. endothermic process
- B. exothermic process
- C. equilibrium process
- D. isolated process

____ 2. The substances in a beaker are at room temperature before a chemical reaction takes place. What do you know if you touch a beaker during the chemical reaction and it feels hot?

- A. The reaction is an endothermic. Heat transfers from the beaker to my hand.
- B. The reaction is endothermic. Heat transfers from my hand to the beaker.
- C. The reaction is exothermic. Heat transfers from my hand to the beaker.
- D. The reaction is exothermic. Heat transfers from the beaker to my hand.

____ 3. In the lab, you dissolve ammonium nitrate in water inside a beaker and measure the temperature with a thermometer in the reaction. Which of the following is NOT part of the surroundings?

- A. air
- B. beaker
- C. thermometer
- D. water

4. Why does an endothermic reaction that takes place in a beaker cause the beaker to feel cold?

5. You have water at 26 °C. You dissolve calcium chloride, CaCl_2 , in the water and find that the temperature increases to 48 °C.

a) Is the process exothermic or endothermic?

b) What is the evidence supporting your claim?

c) Draw a simple, labeled model that illustrates the energy transfer in part a).

Model 2 – Results of Alka-Seltzer[®] Experiment

	Number of Alka-Seltzer Tablets	Volume of Vinegar (mL)	Room Pressure (kPa)	Initial Temp (°C) (Vinegar Solution)	Final Temp. (°C) (Final Mixture)
Trial 1	1	100.0	84	23.5	22.6
Trial 2	2	100.0	84	23.5	21.5
Trial 3	3	100.0	84	23.5	20.4
Trial 4	4	100.0	84	23.5	19.2
Trial 5	5	100.0	84	23.5	18.1

6. Consider the five trials that produced the data in Model 2 above.

a. What is the dependent variable (responding variable)?

b. What is the independent variable (manipulated variable)?

c. List the controlled variables.

7. A well-written research question states the independent and dependent variables for an experiment. Write a research question for the experiment in Model 2.

8. What did the students learn from their Alka-Seltzer results in Model 2?

___ 9. A student wonders, “Will changing the volume of alcohol in a boiling point experiment change the boiling point of the liquid?” What is the dependent variable?

- A. Boiling Point of alcohol
- B. Room Pressure
- C. Type of alcohol
- D. Volume of alcohol

Answer Section

16 points Total

1.A PTS: 1 REF: Unit 5, Section 1 LES: Lesson 2

2.D PTS: 1 REF: Unit 5, Section 1 LES: Lesson 2

3.D PTS: 1 REF: Unit 5, Section 1 LES: Lesson 2

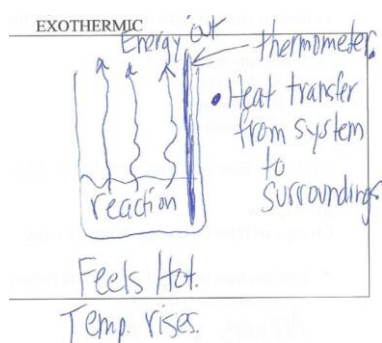
4. PTS: 2 REF: Unit 5, Section 1 LES: Lesson 2

An endothermic reaction transfers heat from the surroundings to the system. OR The beaker feels cold because the heat is transferring from your hand to the beaker.

5.a 1 PT The process is exothermic. Heat is transferring from the solution to the surrounding because the thermometer shows the temperature increased from 26 to 48 °C.

5b. 1 PT The evidence is the temperature increase shown by thermometer.

5c. 2PTS for correctly showing direction of heat transfer and labeling the system/surroundings



6. 1PT a. final temperature of mixture

b. 1PT number of Alka-Seltzer tablets

c. 1PT volume of vinegar, room pressure and initial temperature

7. 2 PTS What is the effect number of Alka-Seltzer tablets on the final temperature of the reaction mixture? Must include both independent and dependent variable.

8. 1 PT The students learned that as the number of Alka-Seltzer tablets increases there is a larger decrease between initial and final temperature. It appears to be 'more' endothermic.

9.A PTS: 1

This is basically NP (2) basic content knowledge quiz.

Awarded

HP(4) 15-16

P(3) 12-14

NP(2) 10-11

BP(1) <10