

Unit 7 Matter & Energy 2018

72 points

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- D 1. A piece of metal is heated, then submerged in cool water. Which statement below describes what happens?
- The temperature of the metal will increase.
 - The temperature of the water will increase.
 - The temperature of the water will decrease.
 - The temperature of the water will increase and the temperature of the metal will decrease.
- B 2. Which of the following is NOT a form of energy?
- light
 - pressure
 - heat
 - electricity
- B 3. When energy is changed from one form to another, ____.
- some of the energy is lost entirely
 - all of the energy can be accounted for
 - a physical change occurs
 - all of the energy is changed to a useful form
- B 4. Heat energy transfer travels ____.
- from the colder object to the hotter object
 - from the hotter object to the colder object
 - in both directions simultaneously
 - from the more dense object to the less dense object
- D 5. Which of the following is an example of a chemical to mechanical energy transformation?
- a ringing church bell
 - a skydiver
 - a cactus
 - a battery-operated toy
- B 6. In an exothermic reaction, the energy stored in the chemical bonds of the **reactants** is ____.
- equal to the energy stored in the bonds of the products
 - greater than the energy stored in the bonds of the products
 - less than the energy stored in the bonds of the products
 - less than the heat released
- A 7. A process that **action** heat is a(n) ____.
- cc** process
 - polythermic process
 - wc** process
 - ectothermic process
- B 8. The quantity of heat required to change the temperature of 1 g of a substance by 1°C is defined as ____.
- a joule
 - specific heat
 - a calorie
 - density
- D 9. How many joules are in 148 calories? (1 cal = 4.18 J)
- 6.61 J
 - 35.4 J
 - 148 J
 - 619 J
- A 10. To convert degrees Celsius to Kelvins, you ____.
- add 273
 - subtract 273
 - multiply by 1.8 and add 32
 - subtract 32 and divide by 1.8
- A 11. The specific heat of silver is $0.24 \frac{\text{J}}{\text{g}^\circ\text{C}}$. How many joules of energy are needed to warm 4.37 g of silver from 25.0°C to 27.5°C?
- 2.62 J
 - 45.5 J

- a. speeds up chemical reactions
- b. causes chemical reactions
- c. is a product in chemical reactions
- d. provides extra heat for chemical reactions

A 26. A catalyst works by _____.

- a. lowering the activation energy barrier
- b. shifting the equilibrium position toward the products
- c. changing the temperature of the reactants
- d. changing the particle size of the reactants

D 27. The science of measuring heat changes is known as _____.

- a. solubility
- b. spontaneity
- c. stoichiometry
- d. calorimetry

C 28. How much heat is absorbed when **gram** g of water melts?

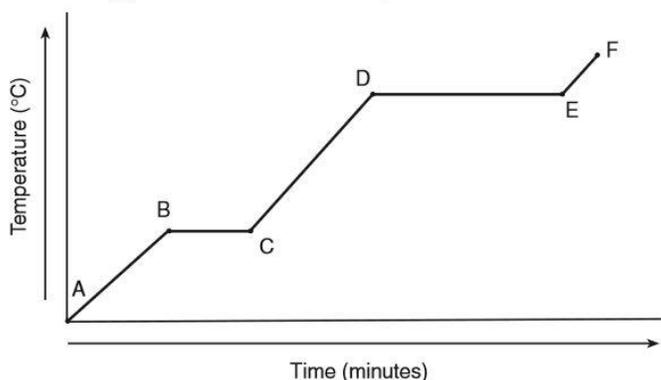
- a. **wc1** kJ
- b. **wc2** kJ
- c. **cc** kJ
- d. **wc3** J

C 29. Which is responsible for the high thermal energy required to vaporize water?

- a. ionic bonds
- b. dispersion forces
- c. hydrogen bonds
- d. ionic attractions

Refer to the heating curve to answer when answering Questions 30-33.

Given the heating curve where substance X starts as a solid below its melting point and is heated uniformly:



B 30. Which process is occurring during segment DE?

- a. substance is melting
- b. substance is vaporizing
- c. substance is freezing
- d. substance is evaporating

C 31. Identify a line segment in which the kinetic energy of the substance is increasing.

- a. Segment DE
- b. Segment BC
- c. Segment AB
- d. all of the segments

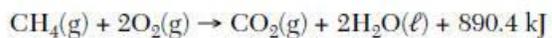
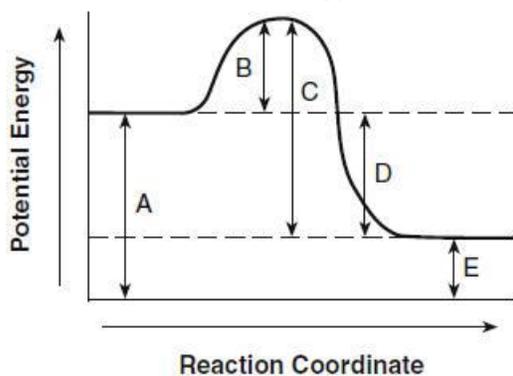
D 32. What thermal energy is imposed on a substance during segment BC?

- a. heat of vaporization
- b. heat of formation
- c. heat of molarization
- d. heat of fusion

C 33. How many calculations will be required to determine the amount of energy needed to raise 25.0g of water from -12.0C to 87C?

- a. 1 calculation
- b. 2 calculations
- c. 3 calculations
- d. 4 calculations

Refer to the Potential Energy curve when answering Questions 34-36.



- B 34. Which line represents the energy of activation?
- | | |
|-----------|-----------|
| a. line A | c. line C |
| b. line B | d. line D |
- D 35. Which line represents the heat of the chemical reaction (ΔH)?
- | | |
|-----------|-----------|
| a. line A | c. line C |
| b. line B | d. line D |
- A 36. This reaction is _____.
- | | |
|----------------|----------------|
| a. exothermic | c. spontaneous |
| b. endothermic | d. ergogenic |

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Answer Section

MULTIPLE CHOICE

- | | | | | |
|-----|---------------------------|----------------------------|---------------------|-------------|
| 1. | ANS: D | DIF: L1 | REF: p. 506 | OBJ: 17.1.1 |
| 2. | ANS: B | DIF: L1 | REF: p. 505 | OBJ: 17.1.1 |
| 3. | ANS: B
STO: 3.1.10.E.1 | DIF: L1 | REF: p. 506 | OBJ: 17.1.1 |
| 4. | ANS: B
STO: 3.4.12.B.1 | DIF: L1 | REF: p. 506 | OBJ: 17.1.1 |
| 5. | ANS: D | DIF: L1 | REF: p. 506 | OBJ: 17.1.1 |
| 6. | ANS: B
STO: 3.4.12.B.1 | DIF: L2 | REF: p. 506 | OBJ: 17.1.1 |
| 7. | ANS: A
STO: 3.4.12.B.1 | DIF: L1 | REF: p. 506 | OBJ: 17.1.2 |
| 8. | ANS: B
STO: 3.4.12.B.4 | DIF: L1 | REF: p. 507 | OBJ: 17.1.2 |
| 9. | ANS: D | DIF: L1 | REF: p. 507 | OBJ: 17.1.3 |
| 10. | ANS: A
STO: 3.4.12.B.4 | DIF: L1 | REF: p. 508 | OBJ: 17.1.3 |
| 11. | ANS: A
OBJ: 17.1.3 | DIF: L2
STO: 3.4.12.B.4 | REF: p. 509, p. 510 | |
| 12. | ANS: B
OBJ: 17.1.3 | DIF: L2
STO: 3.4.12.B.4 | REF: p. 509, p. 510 | |
| 13. | ANS: A | DIF: L1 | REF: p. 520 | OBJ: 17.3.1 |
| 14. | ANS: B | | | |
| 15. | ANS: D
STO: 3.4.12.B.4 | DIF: L2 | REF: p. 521 | OBJ: 17.3.1 |
| 16. | ANS: D | DIF: L1 | REF: p. 42 | OBJ: 2.1.3 |
| 17. | ANS: C | DIF: L1 | REF: p. 41 | OBJ: 2.1.3 |
| 18. | ANS: B
STO: 3.4.10.A.4 | DIF: L1 | REF: p. 401 | OBJ: 13.4.1 |
| 19. | ANS: B
STO: 3.4.12.A.8 | DIF: L2 | REF: p. 474 | OBJ: 16.1.3 |
| 20. | ANS: A | | | |
| 21. | ANS: C
STO: 3.4.10.A.4 | DIF: L1 | REF: p. 520 | OBJ: 17.3.1 |
| 22. | ANS: C | DIF: L1 | REF: p. 42 | OBJ: 2.1.3 |
| 23. | ANS: B
STO: 3.4.10.A.4 | DIF: L1 | REF: p. 389 | OBJ: 13.1.3 |
| 24. | ANS: B
STO: 3.4.10.A.4 | DIF: L1 | REF: p. 388 | OBJ: 13.1.3 |
| 25. | ANS: A | DIF: L1 | REF: p. 772 | OBJ: 24.3.3 |
| 26. | ANS: A | DIF: L1 | REF: p. 546 | OBJ: 18.1.2 |
| 27. | ANS: D | DIF: L2 | REF: p. 571 | OBJ: 18.4.3 |

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|------------|---------|-------------|-------------|
| 28. ANS: C | DIF: L1 | REF: p. 449 | OBJ: 15.1.2 |
| 29. ANS: C | DIF: L3 | REF: p. 449 | OBJ: 15.1.2 |
| 30. ANS: B | | | |
| 31. ANS: C | | | |
| 32. ANS: D | | | |
| 33. ANS: C | | | |
| 34. ANS: B | | | |
| 35. ANS: D | | | |
| 36. ANS: A | | | |