

**Midterm practice test****Multiple Choice**

Choose the correct answer for each question. You may write on the test, however only answers on the scantron will be graded.

$$\Delta H_{\text{fus}} = 6.01 \text{ kJ/mol or } 334 \text{ J/g}$$

$$\Delta H_{\text{vap}} = 40.7 \text{ kJ/mol or } 2260 \text{ J/g}$$

$$c = 4.18 \text{ J/g}^\circ\text{C or } 1.00 \text{ cal/g }^\circ\text{C}$$

**\*Remember your midterms covers everything back to January and the common topics from first semester.**

**\*Your test is very heavy on ch 7 and 8.**













**\*\*If you need help you must come see me before Thursday!**

**\*You will not have time to review on Thursday before the test or add anything on to your midterm sheet.**

- \_\_\_\_\_ 1. What is the net charge of the ionic compound calcium fluoride?
- |       |       |
|-------|-------|
| a. 2- | c. 0  |
| b. 1- | d. 1+ |
- \_\_\_\_\_ 2. Which of the following is NOT a characteristic of most ionic compounds?
- They are solids.
  - They have low melting points.
  - When melted, they conduct an electric current.
  - They are composed of metallic and nonmetallic elements.
- \_\_\_\_\_ 3. What causes water molecules to have a bent shape, according to VSEPR theory?
- repulsive forces between unshared pairs of electrons
  - interaction between the fixed orbitals of the unshared pairs of oxygen
  - ionic attraction and repulsion
  - the unusual location of the free electrons
- \_\_\_\_\_ 4. What type of substance is malleable and ductile?
- |                       |                        |
|-----------------------|------------------------|
| a. Metallic compounds | c. Molecular compounds |
| b. Ionic compounds    | d. Noble Gases         |
- \_\_\_\_\_ 5. What compound should dissolve in water?
- |   |                   |
|---|-------------------|
| a. $\text{PCl}_3$                       | c. $\text{CCl}_4$ |
| b. Hexane ( $\text{C}_6\text{H}_{14}$ ) | d. $\text{SiO}_2$ |
- \_\_\_\_\_ 6. Some of the molecules found in the human body are  $\text{NH}_2\text{CH}_2\text{COOH}$  (glycine),  $\text{C}_6\text{H}_{12}\text{O}_6$  (glucose), and  $\text{CH}_3(\text{CH}_2)_{16}\text{COOH}$  (stearic acid). The bonds they form are
- |             |             |
|-------------|-------------|
| a. Ionic    | c. Metallic |
| b. Covalent | d. Nuclear  |



- \_\_\_\_\_ 18. Which of these elements does not exist as a diatomic molecule?
- a. Ne
  - b. F
  - c. H
  - d. I
- \_\_\_\_\_ 19. Which of the following will conduct electricity?
- a.  $\text{CO}_2$
  - b. LiCl
  - c. CO
  - d.  $\text{N}_2$
- \_\_\_\_\_ 20. What causes dipole interactions?
- a. sharing of electron pairs
  - b. attraction between polar molecules
  - c. bonding of a covalently bonded hydrogen to an unshared electron pair
  - d. attraction between ions
- \_\_\_\_\_ 21. What causes hydrogen bonding?
- a. attraction between ions
  - b. motion of electrons
  - c. sharing of electron pairs
  - d. bonding of a covalently bonded hydrogen atom with an unshared electron pair
- \_\_\_\_\_ 22. Which of the following pairs of elements is most likely to form an ionic compound?
- a. magnesium and fluorine
  - b. sodium and aluminum
  - c. nitrogen and sulfur
  - d. oxygen and chlorine
- \_\_\_\_\_ 23. Which of the following compounds would you expect to be the best conductor of electricity?
- a.  $\text{CH}_4(\text{g})$
  - b.  $\text{H}_2\text{O}(\text{l})$
  - c.  $\text{MgCl}_2(\text{aq})$
  - d.  $\text{N}_2(\text{g})$
- \_\_\_\_\_ 24. Which of the following covalent bonds is the most polar?
- a. C---C
  - b. C---Cl
  - c. C---Br
  - d. C---H
  - e. C---S
- \_\_\_\_\_ 25. How many lone pairs of electrons are on the central atom of dihydrogen sulfide?
- a. 0
  - b. 1
  - c. 2
  - d. 3
  - e. 4
- \_\_\_\_\_ 26. What is the shape of a molecule of  $\text{NI}_3$ ?
- a. Bent
  - b. Linear
  - c. Trigonal Planar
  - d. Trigonal Pyramidal
  - e. Tetrahedral
- \_\_\_\_\_ 27. What is the shape of a molecule of  $\text{CHCl}_3$ ?
- a. Linear
  - b. Bent
  - c. Trigonal Planar
  - d. Trigonal Pyramidal
  - e. Tetrahedral
- \_\_\_\_\_ 28. What is the shape of a molecule of  $\text{NBrO}$ ?
- a. Linear
  - b. Bent
  - c. Trigonal Planar
  - d. Trigonal Pyramidal
- \_\_\_\_\_ 29. Which of the following is the shape of  $\text{C}_2\text{H}_2$ ?
- a. Linear
  - b. Bent
  - c. Trigonal Tetrahedral
  - d. Trigonal Planar

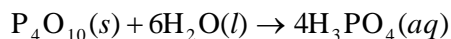
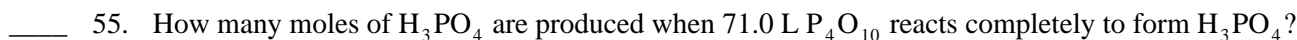
- \_\_\_\_ 30. What intermolecular force holds together molecules of  $\text{SiO}_2$ ?
- Dispersion
  - Dipole-Dipole
  - Hydrogen Bonding
  - Ionic Bonding
- \_\_\_\_ 31. According to the octet rule, Sulfur will gain or share \_\_\_\_\_ electrons.
- 0
  - 1
  - 2
  - 3
  - 6
- \_\_\_\_ 32. How many valence electrons does an atom of any halogen have?
- 5
  - 8
  - 7
  - 1
- \_\_\_\_ 33. Using the electron dot structure, what would a chlorine atom look like?
- 
  - 
  - 
  - 
- \_\_\_\_ 34. What is the correct electron dot structure for Sulfur?
- 
  - 
  - 
  - 
- \_\_\_\_ 35. Using the electron dot structure, a phosphide ion would most look like \_\_\_\_\_.
- 
  - 
  - 
  - 
- \_\_\_\_ 36. Which of these is **not** a characteristic of most ionic compounds?
- They have low melting points.
  - They are composed of metallic and nonmetallic elements.
  - When melted they conduct an electric current.
  - They are crystalline solids with repeating patterns.
- \_\_\_\_ 37. What force is found between all molecules?
- dipole-dipole
  - dispersion
  - hydrogen bonding
  - ionic bonding
- \_\_\_\_ 38. Which of the forces of molecular attraction is the weakest?
- Dispersion
  - Hydrogen bonding
  - dipole interactions
  - ionic bonding
- \_\_\_\_ 39. What type of intermolecular force is the most important in  $\text{SiO}_2$ ?
- Dispersion
  - Dipole-Dipole Forces
  - Hydrogen Bonding





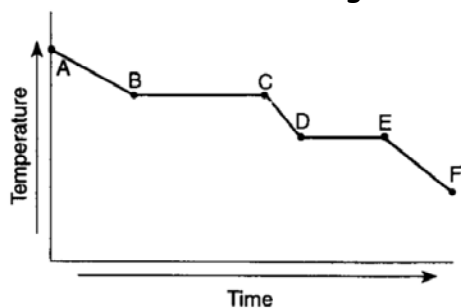
The correct products for the following reaction is:

- a. MgCl + H<sub>2</sub>    c. MgCl<sub>2</sub> + H<sub>2</sub>  
b. MgH<sub>2</sub> + Cl<sub>2</sub>                                        d. no reaction



- a. 6.35 mol    c. 16.0 mol  
b. 397.6 mol    d. 12.7 mol

\_\_\_ 56. The graph below represents the uniform cooling (freezing) of a substance, starting with the substance as a gas above its boiling point.

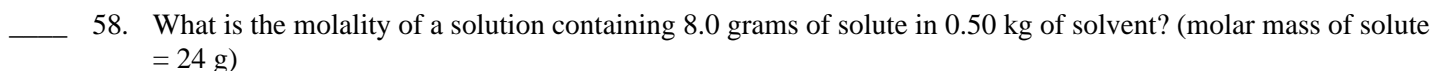


Choose the correct formula to find the amount of heat change from D to E.

- a.  $Q = m\Delta H_{\text{vap}}$     d.  $Q = m(-\Delta H_{\text{vap}})$   
b.  $Q = m\Delta H_{\text{fus}}$     e.  $Q = mC\Delta T$   
c.  $Q = m(-\Delta H_{\text{fus}})$



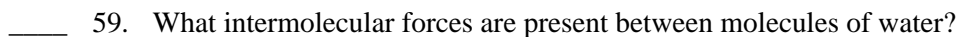
- a. 20.9 kJ    c. 0 J  
b. 226 kJ    d. 16.7 kJ



- a. 0.17m    c. 4m  
b. 0.67m    d. 1.67m

### Multiple Response

Identify one or more choices that best complete the statement or answer the question.



- a. Dispersion    c. Hydrogen Bonding  
b. Dipole-Dipole    d. Ionic Bonding



- a. CHCl<sub>3</sub>    d. F<sub>2</sub>  
b. SCl<sub>2</sub>    e. CO<sub>2</sub>  
c. HNO

Name: \_\_\_\_\_

ID: A

\_\_\_\_\_ 61. Which of the following molecules are polar?

a.  $\text{NH}_3$

b. HF

c.  $\text{CCl}_4$

d.  $\text{HCOOH}$

## Midterm practice test Answer Section

### MULTIPLE CHOICE

- |     |                              |   |         |                      |
|-----|------------------------------|---|---------|----------------------|
| 1.  | ANS: C<br>OBJ: 7.2.1         | PTS: 1<br>STA: Ch.3.a                   | DIF: L1 | REF: p. 194          |
| 2.  | ANS: B<br>OBJ: 7.2.2         | PTS: 1<br>STA: Ch.2.a                   | DIF: L1 | REF: p. 196   p. 198 |
| 3.  | ANS: A<br>OBJ: 8.3.2         | PTS: 1<br>STA: Ch.2.a                   | DIF: L2 | REF: p. 233          |
| 4.  | ANS: A                       | PTS: 1                                  |         |                      |
| 5.  | ANS: A                       | PTS: 1                                  |         |                      |
| 6.  | ANS: B                       | PTS: 1                                  |         |                      |
| 7.  | ANS: C                       | PTS: 1                                  |         |                      |
| 8.  | ANS: A<br>St. 1c             |   |         |                      |
|     |                              | PTS: 1<br>STA: 1c                       |         |                      |
| 9.  | ANS: D                       | PTS: 1                                  |         |                      |
| 10. | ANS: B<br>Stt. 4h            |   |         |                      |
|     |                              | PTS: 1<br>STA: 4h                       |         |                      |
| 11. | ANS: B<br>St. 1c             |   |         |                      |
|     |                              | PTS: 1                                  |         |                      |
| 12. | ANS: A                       | PTS: 1                                  |         |                      |
| 13. | ANS: B                       | PTS: 1                                  |         |                      |
| 14. | ANS: A                       | PTS: 1                                  |         |                      |
| 15. | ANS: D<br>OBJ: 7.1.1         | PTS: 1<br>STA: Ch.1.c   Ch.2.a   Ch.1.d | DIF: L1 | REF: p. 187          |
| 16. | ANS: D<br>OBJ: 7.1.1         | PTS: 1<br>STA: Ch.1.g                   | DIF: L2 | REF: p. 190          |
| 17. | ANS: B<br>OBJ: 7.1.4         | PTS: 1<br>STA: Ch.1.g                   | DIF: L1 | REF: p. 192          |
| 18. | ANS: A<br>OBJ: 8.2.1         | PTS: 1<br>STA: Ch.2.a                   | DIF: L1 | REF: p. 217          |
| 19. | ANS: B<br>OBJ: 8.2.1   8.2.4 | PTS: 1<br>STA: Ch.2.a                   | DIF: L2 | REF: p. 222          |
| 20. | ANS: B<br>OBJ: 8.1.1   8.4.3 | PTS: 1<br>STA: Ch.2.a                   | DIF: L1 | REF: p. 240          |
| 21. | ANS: D<br>OBJ: 8.4.3         | PTS: 1<br>STA: Ch.2.a                   | DIF: L2 | REF: p. 241          |
| 22. | ANS: A                       | PTS: 1                                  |         |                      |
| 23. | ANS: C                       | PTS: 1                                  |         |                      |



24. ANS: B PTS: 1  
 25. ANS: C PTS: 1  
 26. ANS: D PTS: 1  
 27. ANS: E PTS: 1  
 28. ANS: B PTS: 1  
 29. ANS: A PTS: 1  
 30. ANS: A PTS: 1  
 31. ANS: C PTS: 1  
 32. ANS: C PTS: 1  
 33. ANS: A PTS: 1  
 34. ANS: D PTS: 1  
 35. ANS: C PTS: 1  
 36. ANS: A PTS: 1  
 37. ANS: B PTS: 1  
 38. ANS: A PTS: 1  
 39. ANS: A PTS: 1  
 40. ANS: A PTS: 1  
 41. ANS: C PTS: 1  
 42. ANS: C PTS: 1  
 43. ANS: C  
 ST 2A, 2B

PTS: 1

44. ANS: A PTS: 1  
 45. ANS: A PTS: 1  
 46. ANS: C  
 St. 6d

KEY: Representative Particles to Mass

STA: 3a KEY: Balancing Equations

PTS: 1

STA: 6d

47. ANS: D  
 St. 7b

PTS: 1

48. ANS: A  
 St. 4c

PTS: 1

STA: 4c

49. ANS: A  
 St. 7d

PTS: 1

STA: 7d

50. ANS: A  
 St. 4h

PTS: 1

STA: 4h

51. ANS: B  
ST 2A

PTS: 1

52. ANS: C PTS: 1

53. ANS: A  
ST 2A, 2B

PTS: 1

54. ANS: C  
ST 3

PTS: 1

55. ANS: D PTS: 1 STA: 3a KEY: Balancing Equations

56. ANS: C PTS: 1

57. ANS: D PTS: 1

58. ANS: B PTS: 1 DIF: L2 REF: p. 491

OBJ: 16.4.1 STA: Ch.6.d

#### MULTIPLE RESPONSE

59. ANS: A, B, C PTS: 1

60. ANS: D, E PTS: 1

61. ANS: A, B PTS: 1