

## Colligative Properties – Sample Questions

10) Which of the following statements about colligative properties is FALSE?

- A) The boiling point of a solution is increased by the addition of salt.
- B) The freezing point of a solution is lowered by the addition of salt.
- C) The change in temperature is proportional to the molality.
- D) The identity of the solute is not a factor.
- E) All of the above statements are true.

2. When a solute dissolves in water, it is expected to

- A.  raise the freezing point and lower the boiling point of the water
- B.  raise the freezing point and the boiling point of the water
- C.  lower the freezing point and the boiling point of the water
- D.  lower the freezing point and raise the boiling point of the water

3. Create the equation for the dissociation of  $\text{CaBr}_{2(s)}$  in water:

4. Classify the type of behavior the following solutes show when dissolved in water –

Dissociate (D) or No Dissociation (ND):

- \_\_\_ a.  $\text{Al}(\text{NO}_3)_3$
- \_\_\_ b.  $\text{CH}_3\text{OH}$
- \_\_\_ c.  $\text{MgF}_2$

5. Classify each of the following as an electrolyte (E) or nonelectrolyte (N):

- \_\_\_ a.  $\text{NaCl}_{(s)}$
- \_\_\_ b.  $\text{NaCl}_{(aq)}$
- \_\_\_ c.  $\text{KHCO}_3_{(aq)}$
- \_\_\_ d.  $\text{C}_2\text{H}_5\text{OH}_{(aq)}$
- \_\_\_ e.  $\text{C}_{12}\text{H}_{22}\text{O}_{11} (aq)$

6. Conclude the value of the Van't Hoff Factor for the following soluble solutes:

a.  $C_7H_6O_2$  \_\_\_\_\_

b.  $CsI$  \_\_\_\_\_

c.  $AgNO_3$  \_\_\_\_\_

d.  $Cu(C_2H_3O_2)_2$  \_\_\_\_\_

e.  $C_3H_7OH$  \_\_\_\_\_

### Answers:

10. E

2. D

3.  $CaBr_{2(s)} \rightarrow Ca^{+2}_{(aq)} + 2 Br^{-1}_{(aq)}$

4. a. D

b. ND

c. D

5. a. N

b. E

c. E

d. N

e. N

Only ionic solutes, when dissolved in solvent, dissociate to create free moving ions – in solid state, ions are not free moving.

6. a. 1 (covalent solute – will not dissociate)

b. 2 (ionic solute – will dissociate creating two free moving ions)

c. 3 (ionic solute – dissociates into three ions)

d. 1 (covalent solute – will not dissociate)