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**SELECTED AND CONSTRUCTED RESPONSE ITEMS C 3.4g**

Explain why gases are less soluble in warm water than in cold water.

Selected/Constructed Response Items for Thermochemistry of Solutions

C3.4g Calculate why gases are less soluble in warm water than cold water.

1. Solvent molecules with \_\_\_\_\_\_\_ can dissolve more solute particles.
2. Small solute surface area
3. Great attractive forces
4. Most kinetic energy
5. Decreased pressure
6. Increasing the temperature will:
7. Decrease solubility
8. Increase solubility
9. Equalize solubility
10. Have very little affect on solubility
11. Temperature and pressure of gases dissolved in liquids have a \_\_\_\_\_\_\_\_\_\_ relationship:
    1. Causational
    2. Linear
    3. Inversely proportional
    4. Directly proportional
12. Which law illustrates that gases solubility decreases with increasing temperature:
    1. Gay-Lussac’s Law
    2. Boyle’s Law
    3. Le Chatlier’s Principle
    4. Charles’ Law
13. What happens to molecular motion of a liquid as the temperature increases:
    1. The molecules move slower, as they leave the liquid phase
    2. The molecules move faster, as they leave the liquid phase
    3. The molecules move faster, because of increased entropy
    4. The molecules move faster, because of decreased entropy

Teacher Companion Notes for Selected/Constructed Response Items for **Thermochemistry of Solutions**

**C2.2e**

**Question 1**: Medium, most students should be able to answer correctly.

**Correct answer, C,** *Generally, an increase in the temperature of the solution increases the solubility of a solid solute.*

Distracter a, incorrect association with surface area of solute.

Distracter b, incorrect association with attractive forces

Distracter d, incorrect association with pressure

**Question 2**: Easy, all students should be able to answer.

**Correct answer, A,**

Distracter b, incorrect association with temperature and solubility.

Distracter c, incorrect association with temperature and solubility.

Distracter d, incorrect association with temperature and solubility.

**Question 3:** Medium some student will be able to answer question correctly.

**Correct answer, d,** *most gases become less soluble in water at higher temperatures; therefore, as temperature increases solubility decreases.*

*Distracter a,* incorrect association with temperature and solubility.

Distracter b, incorrect association with temperature and solubility.

Distracter c, incorrect association with temperature and solubility.

**Question 4**, Difficult, challenging question for most students.

**Correct Answer, c,** The principle states that when a system at equilibrium is placed under stress, the equilibrium will shift in a way that relieves that stress. In this case, the "stress" is the addition of heat.

Distracter a, incorrect association with temperature and pressure of gases.

Distracter b, incorrect association with pressure and volume of gases.

Distracter d, incorrect association with volume and temperature of gases.

**Question 5**, Difficult, challenging question for most students.

**Correct Answer, c,**

Distracter a, incorrect association with molecular speed and phase change

Distracter b, not the best answer for the question molecules move the fastest in the gas phase.

Distracter d, incorrect association with molecular motion and entropy.