

- As a solute is added to a solvent, what happens to the freezing point and the boiling point of the solution?
  - The freezing point decreases and the boiling point increases.
  - The freezing point increases and the boiling point increases.
  - The freezing point increases and the boiling point decreases.
  - The freezing point decreases and the boiling point decreases.
- Compared to the freezing point of 1.0 M KCl(aq) at standard pressure, the freezing point of 1.0 M CaCl<sub>2</sub>(aq) at standard pressure is
  - lower
  - higher
  - the same
- Which aqueous solution of KI freezes at the lowest temperature?
  - 1 mol of KI in 500. g of water
  - 2 mol of KI in 500. g of water
  - 1 mol of KI in 1000. g of water
  - 2 mol of KI in 1000. g of water
- A 1 kilogram sample of water will have the highest freezing point when it contains
  - $1 \times 10^{21}$  dissolved particles
  - $1 \times 10^{17}$  dissolved particles
  - $1 \times 10^{19}$  dissolved particles
  - $1 \times 10^{23}$  dissolved particles
- A solution consists of 0.50 mole of CaCl<sub>2</sub> dissolved in 100. grams of H<sub>2</sub>O at 25°C. Compared to the boiling point and freezing point of 100. grams of H<sub>2</sub>O at standard pressure, the solution at standard pressure has
  - a higher boiling point and a lower freezing point
  - a lower boiling point and a lower freezing point
  - a higher boiling point and a higher freezing point
  - a lower boiling point and a higher freezing point
- Which solution will freeze at the *lowest* temperature?
  - 1 mole of sugar in 500 g of water
  - 1 mole of sugar in 1,000 g of water
  - 2 moles of sugar in 1,000 g of water
  - 2 moles of sugar in 500 g of water
- Which solution has the highest boiling point at standard pressure?
  - 0.10 M K<sub>3</sub>PO<sub>4</sub>(aq)
  - 0.10 M KCl(aq)
  - 0.10 M KNO<sub>3</sub>(aq)
  - 0.10 M K<sub>2</sub>SO<sub>4</sub>(aq)
- Which concentration of a solution of CH<sub>3</sub>OH in water has the *lowest* freezing point?
  - 0.001 M
  - 0.1 M
  - 0.01 M
  - 0.0001 M
- How do the boiling point and freezing point of a solution of water and calcium chloride at standard pressure compare to the boiling point and freezing point of water at standard pressure?
  - Both the freezing point and boiling point of the solution are higher.
  - The freezing point of the solution is higher and the boiling point of the solution is lower.
  - The freezing point of the solution is lower and the boiling point of the solution is higher.
  - Both the freezing point and boiling point of the solution are lower.
- Compared to a 2.0 M aqueous solution of NaCl at 1 atmosphere, a 3.0 M aqueous solution of NaCl at 1 atmosphere has a
  - lower boiling point and a higher freezing point
  - higher boiling point and a higher freezing point
  - lower boiling point and a lower freezing point
  - higher boiling point and a lower freezing point