

Solutions Practice Quiz

- 1) How would you make a saturated solution from an unsaturated solution? (2 pts)
- 2) The solubility of an ionic compound in water at 25⁰ C is 5.0 grams/liter. List all of the possible methods one might use to make more than 5.0 grams of this compound dissolve in one liter of water. (3 pts)
- 3) What is the molarity of a solution that contains 55 grams of copper (II) chloride dissolved in 1500 mL of water? (3 pts)
- 4) What would the boiling point of a 0.75 m BeF₂ solution be? $K_b(\text{H}_2\text{O}) = 0.51^0 \text{ C/m}$. (3 pts)
- 5) Rank the following three solutions from lowest to highest melting point: 0.25 m barium hydroxide, 0.45 m sugar, 0.65 m sodium hydroxide. (3 pts)
- 6) Why does increasing the solute concentration decrease the melting point? (3 pts)
- 7) If I dilute 550 mL of 0.75 M lithium acetate solution to a volume of 750 mL, what will the molarity of the resulting solution be? (3 pts)

Solutions Quiz - Answers

- 1) How would you make a saturated solution from an unsaturated solution? (2 pts)
Add more of the solute until it starts to settle to the bottom.
- 2) The solubility of an ionic compound in water at 25^o C is 5.0 grams/liter. List all of the possible methods one might use to make more than 5.0 grams of this compound dissolve in one liter of water. (3 pts)
I know of only one method: Heat the solvent.
- 3) What is the molarity of a solution that contains 55 grams of copper (II) chloride dissolved in 1500 mL of water? (3 pts)
0.27 M
- 4) What would the boiling point of a 0.75 m BeF₂ solution be? K_b(H₂O) = 0.51^o C/m. (3 pts)
101.15^o C (remember, the effective molality is 3 x 0.75 = 2.25 m)
- 5) Rank the following three solutions from lowest to highest melting point: 0.25 m barium hydroxide, 0.45 m sugar, 0.65 m sodium hydroxide. (3 pts)
**Effective molalities of these three solutions are 0.75 m Ba(OH)₃, 0.45 m sugar, 1.30 m NaOH. As a result, the order would be, from lowest to highest:
sugar < barium hydroxide < sodium hydroxide**
- 6) Why does increasing the solute concentration decrease the melting point? (3 pts)
Compounds exist as solids when the intermolecular forces keep the molecules locked in place. The addition of a solute interrupts the intermolecular forces between solvent molecules, making the intermolecular forces less strong and easier to disrupt. As a result, the compound will melt at a lower temperature.
- 7) If I dilute 550 mL of 0.75 M lithium acetate solution to a volume of 750 mL, what will the molarity of the resulting solution be? (3 pts)
 **$M_1V_1 = M_2V_2$
(0.75 M)(550 mL) = M₂ (750 mL)
M₂ = 0.55 M**