

Name: \_\_\_\_\_  
Colligative Properties Worksheet

Date: \_\_\_\_\_

1. For a 0.202 m aqueous solution of sucrose ( $C_{12}H_{22}O_{11}$ ), what is the boiling point?
2. What is the normal boiling point of a 0.102 m aqueous solution of KI?
3. Determine colligative moles of ethylene glycol ( $C_2H_6O_2$ ), a nonvolatile nonelectrolyte. Calculate the boiling point and freezing point of a 25.0 mass percent solution of ethylene glycol in water.
4. Calculate the freezing point of a solution containing 40.0 g of sucrose ( $C_{12}H_{22}O_{11}$ ) in 100 g of water. Assume the boiling point of water is 100.0 °C and  $K_b$  for water is 0.512 °C/m and normal freezing point is 0.00 °C.
5. List the following aqueous solutions in order of their expected freezing points: 0.050 m  $CaCl_2$ , 0.10 m  $NaCl$ , 0.10 m  $KCl$ , 0.10 m  $C_2H_5OH$ , starting with the most depressed.
6. A solution of an unknown nonvolatile nonelectrolyte was prepared by dissolving 0.250 g in 10.0 g  $CCl_4$ . The normal boiling point of the resultant solution increased by 0.257 °C. Calculate the molar mass of the solute.  $K_b$  = 5.03 °C/m
7. Camphor ( $C_{10}H_{16}O$ ) melts at 179.8 °C. It also has particularly large freezing point depression constant,  $K_f$  = 40 °C/m. When 0.100 g of an organic substance of unknown molar mass is dissolved in 0.100 g of liquid camphor, the freezing point of the mixture is found to be 176.7 °C. What is the approximate molar mass of the solute?  $K_f$  = 40 °C/m