

## Solutions - II Osmotic Pressure + Van't Hoff Factor.

- ① Calculate the osmotic pressure of a 0.0500 M  
\*  $MgSO_4$  solution at  $25^\circ C$ . ( $i$  for  $MgSO_4 = 1.3$ )

Ans

$$\begin{aligned}\pi &= i M R T \\ &= 1.3 \times 0.0500 \times 0.0821 \frac{L \cdot atm}{mol \cdot K} \times 298 K \\ &= \boxed{1.6 \text{ atm}}\end{aligned}$$

$25 + 273 = 298 K$

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- ② Calculate the van't Hoff factor of  $Na_3PO_4$  in  
\* 0.40 m solution whose freezing point is  
 $-2.6^\circ C$  ( $k_{f, H_2O} = 1.86^\circ C/m$ ).  $Na_3PO_4 = \underline{4 \text{ ions}}$

$$\Delta T_f = i k_f m$$

$$\begin{aligned}i &= \frac{\Delta T_f}{k_f m} = \frac{2.6^\circ C}{1.86^\circ C/m \times 0.40 m} \\ &= \boxed{3.5}\end{aligned}$$

