

(1)

H.1

SUCROSE

$$M = 342 \text{ g/mol}$$

$$C^* = 2040 \text{ g/Kg WATER}$$

$$\rho^* = 1.33 \text{ g/cm}^3$$

$$C = 2450 \text{ g/Kg WATER}$$

$$\rho = 1.36 \text{ g/cm}^3$$

<u>BASIS</u>	<u>C</u>	<u>C*</u>	<u>ΔC</u>	<u>S</u>	<u>∇</u>
g/Kg H ₂ O	2450	2040	410	1.201	0.201
g/Kg SOLN	710.1	671.1	39.0	1.058	0.058
g/L SOLN	965.7	892.6	73.1	1.082	0.082
mol/L SOLN	2.82	2.61	0.21	1.082	0.082
mol fraction	0.1143	0.0971	0.0172	1.177	0.177

$$\frac{2040 \text{ g SUC}}{\text{Kg H}_2\text{O}} \Rightarrow \frac{2040 \text{ g SUC}}{3.040 \text{ g SOLN}} = \underline{\underline{671.1 \text{ g/Kg SOLN}}}$$

$$\frac{2450 \text{ g SUC}}{\text{Kg H}_2\text{O}} \Rightarrow \frac{2450 \text{ g SUC}}{3.450 \text{ g SOLN}} = \underline{\underline{710.1 \text{ g/Kg SOLN}}}$$

(2)

$$\frac{671.1 \text{ g}}{\text{Kg SOLN}} \times \frac{1.33 \text{ g}}{\text{cm}^3} = \frac{892.6 \text{ g}}{\text{L}} \times \frac{\text{mol}}{342 \text{ g}} = \underline{\underline{2.61 \frac{\text{mol}}{\text{L}}}}$$

$$\frac{710.1 \text{ g}}{\text{Kg SOLN}} \times \frac{1.36 \text{ g}}{\text{cm}^3} = \frac{965.7 \text{ g}}{\text{L}} \times \frac{\text{mol}}{342 \text{ g}} = \underline{\underline{2.82 \frac{\text{mol}}{\text{L}}}}$$

$$\frac{2040 \text{ g SUC}}{\text{Kg H}_2\text{O}} \times \frac{0.01802 \text{ Kg H}_2\text{O}}{\text{mol H}_2\text{O}} \times \frac{\text{mol SUC}}{342 \text{ g SUC}} = \frac{0.1075 \text{ mol SUC}}{\text{mol H}_2\text{O}}$$

$$\Rightarrow \frac{0.1075 \text{ mol SUC}}{1.1075 \text{ mol SOLN}} = \underline{\underline{0.0971 \frac{\text{mol SUC}}{\text{mol SOLN}}}}$$

$$\frac{2450 \text{ g SUC}}{\text{Kg H}_2\text{O}} \times \frac{0.01802 \text{ Kg H}_2\text{O}}{\text{mol H}_2\text{O}} \times \frac{\text{mol SUC}}{342 \text{ g SUC}} = \frac{0.1291 \text{ mol SUC}}{\text{mol H}_2\text{O}}$$

$$\Rightarrow \frac{0.1291 \text{ mol SUC}}{1.1291 \text{ mol SOLN}} = \underline{\underline{0.1143 \frac{\text{mol SUC}}{\text{mol SOLN}}}}$$