

Question #64880, Chemistry / General chemistry

Find the molality of 5.25 kg of sugar, $C_{12}H_{22}O_{11}$ [MW: 342 g/mol] dissolved in 6 liters of ammonium hydroxide. The density of ammonium hydroxide is found to be 880 kg/m³.

Solution

$$b = n/m$$

$$n(C_{12}H_{22}O_{11}) = m/M = 5250 / 342 = 15.35 \text{ (mol)}$$

$$m(NH_3 \cdot H_2O) = V \cdot \rho = 6 \cdot 0.88 = 5.28 \text{ (kg)}$$

$$b = n(C_{12}H_{22}O_{11}) / m(NH_3 \cdot H_2O) = 15.35 / 5.28 = 2.90 \text{ (mol/kg)}$$

Answer

$$b(C_{12}H_{22}O_{11}) = 2.90 \text{ mol/kg}$$

Answer provided by <https://www.AssignmentExpert.com>