Freezing Point Dep. KEY

CHM 1046

1. If 1.628 g of an unknown solid dissolved in 80.24 g of cyclohexanol lowered the FP of cyclohexanol by 6.6°C, what is the MM of the unknown solid? Kf = -39.5 °C \*kg/mol

ΔTf = Kf \* m

-6.6°C = -39.5 °C \*kg/mol \* m

m = .167 mol/kg

m = .167 mol/kg = x mol / .08024 kg cyclohexanol

x mol = .0134 mol unknown solid

MM = g/mol = 1.628 g of an unknown solid / .0134 mol unknown solid = 121.5 g/mol

1. If 6.45 g of an unknown solid dissolved in 605.13 g of cyclohexanol lowered the FP of cyclohexanol by 11.9°C, what is the MM of the unknown solid? Kf = -39.5 kg/mol

ΔTf = Kf \* m

-11.9°C = -39.5 °C \*kg/mol \* m

m = .301 mol/kg

m = .301 mol/kg = x mol / .60513 kg cyclohexanol

x mol = .182 mol unknown solid

MM = g/mol = 6.45 g of an unknown solid / .182 mol unknown solid = 35.4 g/mol