Name Key

Daily Problems #11 and #12

An antifreeze solution is prepared by dissolving 4.00 L of propylene glycol ($C_3H_8O_2$, density, 1.04 g/mL) in 4.00 L of water (**solvent**, density, 1.00 g/mL) to give 8.00 L of **solution**. Calculate the:

a. **molarity** of the propylene glycol solution. **6.83 M $C_3H_8O_2$**

b. **molality** of the propylene glycol solution. **13.7 *m* $C_3H_8O_2$**

Daily Problem #13

Nitrox36 is **0.360 mole fraction of O_2 in N_2** used by scuba divers to reduce the possibility of "the bends".

Compare (by calculation) the mass (g) of N_2 dissolved in the blood (5.00 L) of a diver at a depth of 30 m (P_{total} 3040 torr) using:

normal air **0.277 g N_2**
nitrox36 **0.224 g N_2**

normal mole fraction of O_2 in N_2 = 0.209
k of N_2 in blood at 25.0 °C = 6.25×10^{-4} M/atm

Daily Problems #14 and #15

For the solution prepared in problems #11 and #12 and a chromium(III) sulfate solution of the **same number of moles in the same volume of water**, calculate:

a.	The vapor pressure at 100.0 °C.	**propylene glycol solution**	**609 torr**
		chromium(III) sulfate solution	**99.5 torr**
b.	The normal boiling point.	**propylene glycol solution**	**107.1 °C**
		chromium(III) sulfate solution	**136 °C**

Both propylene glycol and chromium(III) sulfate are nonvolatile.