Answer on Question #73223 – Chemistry – General Chemistry

Ethylene glycol, $C_2H_6O_2$, is more commonly known as antifreeze. What molality of an aqueous solution of ethylene glycol is needed for the freezing point to be -12.7 °C at a pressure of exactly 1 atm? Correct number of sig figs.

Solution:

$\Delta T_{freezing} = K_f \times C_m$

ΔT = freezing point elevation

$\Delta T = T_{final} - T_{initial} = -12.7 - 0 = -12.7$ °C

K_f – cryoscopic constant, K_f (H_2O) = - 1.86 °C kg/mole

Molality $C_m = \Delta T_{freezing} / K_f = -12.7 / -1.86 = 6.83$ moles/kg

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