

#72737 Chemistry, Other

If the mole fraction of glucose in water is 0.050 for a particular solution, what is the molality of this solution?

A] 5.6 m

B] None of the listed answers are correct

C] 0.50 m

D] 0.34 m

E] 2.9 m

Answer:

$$(X_A \times 1000) / (X_B \times \text{mol.wt. of B}) = \text{molality 'm'}$$

$$X_B = 1 - X_A$$

X_B =mole fraction of water

$$(X_A \times 1000) / (1 - X_A) \text{ mol.wt. of B} = \text{molality 'm'}$$

X_A = mole fraction of glucose

$$X_A = 0.050$$

$$1 - X_A = 1 - 0.05 = 0.95$$

$$m = 0.05 \times 1000 / (0.95 \times 18)$$

$$m = 2.92 \text{ mole/kg}$$

Correct answer: E] 2.9 m.