## Answer on Question#49322 – Chemistry, Physical Chemistry

3% solution of glucose is isotonic with 1% solution of a non-volatile non-electrolyte substance. The molecular mass of the substance would be

1. 180
2. 360
3. 420
4. 60

**Solution**:

M(C6H12O6)=180 g/mol;

According to van't Hoff's rule:

$\pi$=CRT; $\pi$-the osmotic pressure; C – the molar concentration (mol/L); R – the universal gas constant; T – the temperature (K);

$\pi_1 = \pi_2$;

$C = \frac{\nu}{V}$; $\nu$-the mole (mol); V – the volume of the solution (L);

$C_1RT=C_2RT$; $T_1=T_2$; $\frac{\nu_1}{V} = \frac{\nu_2}{V}$; $V_1=V_2$;

$\nu = \frac{m}{M}$; m –the mass (g); M –the molar mass (g/mol);

$$\frac{m(C6H12O6)}{M(C6H12O6)} = \frac{m(X)}{M(X)};$$

$$W = \frac{m(solute)}{m(solution)};$$

W(C6H12O6)=3%; W(X)=1%; $m_1$(solution)=$m_2$(solution); m(C6H12O6)=3m(X);

$$M(X) = \frac{m(X)M(C6H12O6)}{3m(X)} = \frac{M(C6H12O6)}{3};$$

M(X)=60 g/mol;

**Answer: 4.** 60