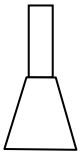
BIO416K Practice Osmolarity Problems - Key

Answer the questions below based on the following solution:

You have **400 ml of a 15 % $MgCl_2$ solution**
(MW Mg = 24.3, Cl = 35.5)
(Each mole of $MgCl_2$= 3 osmoles in solution)
Show your work.



1. Since this is a 15% solution, how many grams of $MgCl_2$ are in 100 ml of the solution?

15% means 15 g/100ml . 15g

2. How many grams total are in the 400 ml?

15g/100ml = Xg/400ml X= 60 g

3. How many grams does 1 mole of $MgCl_2$ weigh?

Molecular weight if $MgCl_2$ is 24.3+35.5+35.5 = 95.3.

One mole therefore weighs 95.3 g

4. How many moles are in the 400 ml $MgCl_2$solution?

There are 60 g in the 400 ml solution. Convert grams to moles.

(60 g) (1 mole/95.3 g) = 0.63 moles

5. How many osmoles are in the 400 ml $MgCl_2$solution?

Each mole is 3 osmoles. Convert moles to osmoles.

0.63 moles (3 osmole/mole) = 1.89 osmoles

6. What is the osmolarity of the $MgCl_2$ solution?

With 1.89 osmoles in 400 ml, how many osmoles would be in 1 liter?

1.89osmoles/400ml (1000ml/l) = 4.73 osmoles/liter

Osmolarity is 4.73 OsM