STE **<u>Extra Practice with Molarity</u>** **SOLUTIONS**

$$n = CV \text{ or } C = \frac{n}{V}$$

n = moles of solute
C = concentration (moles/L= molarity)
V = volume of solution in L

1.   In 10.0 mL of a certain solution, there are 0.050 g of KF. Find the molarity of the solution (moles/L)

0.050 g KF(mole/58 g) = 8.62 X 10^{-4} moles KF
10.0 ml = 0.010 L

$C = \dfrac{n}{V}$ = 8.62 X 10^{-4} moles/0.010 L = 0.086 moles KF/L

2.   In 2.0 L of a solution, there are 3.0 g of KF. Find the molarity.

3 g KF(mole/58 g) = 0.0517 moles KF

$C = \dfrac{n}{V}$ = 0.0517 moles KF /2.0 L = 0.026 moles KF/L

3.   How many grams of NaCl are needed to prepare 1.5 L of a 0.20 mole/L solution?

n = CV
= 0.20 mole of NaCl *(1.5 L) = 0.30 moles NaCl

Moles * molar mass = mass
0.30 moles NaCl*(23+35.5)g/mole = 17.55 g NaCl

4.   How many grams of $LiNO_3$ are needed to prepare 500 ml of a 0.10 mole/L solution?

n = CV
= 0.10 mole of $LiNO_3$*(0.500 L) = 0.050 moles $LiNO_3$
Moles * molar mass = mass
0.050 moles $LiNO_3$*(7+14 + 16*3)g/mole = 3.45 g $LiNO_3$

5.   What is the volume of a solution containing 3.0 grams of HCl if the concentration is 0.50 mole/L.

3.0 g HCl (mole/36.5 g) = 0.0822 moles HCl

$n = CV$
0.0822 moles = (0.50 mole/L) V
V = 0.0822 moles / (0.50 mole/L) = 0.164 L

Competency 1

6.   Explain how you would actually prepare 2.0 L of a 0.2 mole/L $MgCl_2$ solution in the lab.

n = CV = 0.2mole/L (2.0 L) = 0.4 moles
0.4 moles(24+35.5*2) = 38 g

1.   Weigh out 38 grams of $MgCl_2$
2.   Dissolve in less than 2.0 L in alarge beaker.
3.   Transfer to a 2.0 L volumetric flask.
4.   Rinse beaker into flask.
5.   Add water to fill to white line of flask, stopper and mix.

7.   Find the **error** in the student's procedure. Explain why.

1. The student weighed 0.10 grams of a solid to make 0.10 L of a solution.
2. He transferred the solid into a beaker.
3. He added less than 100 ml of water and stirred.
4. He used more water to make sure that he got all of the solution out of the beaker as he transferred it into a second beaker.
5. He added water to the 100 ml line and then carefully mixed.

Error is in step 4 because a beaker is too wide to measure volume accurately.

Recent Advances in Science. #32:

Dr Ed Henderson demonstrates that it IS possible for someone to become too familiar with the safety rules.