Molarity Problems Worksheet

$M = \dfrac{n}{V}$
- n= # moles
- V must be in liters (change if necessary)
- Use M or mol/L as unit for molarity

1. What is the molarity of a 0.30 liter solution containing 0.50 moles of NaCl?

2. Calculate the molarity of 0.289 moles of $FeCl_3$ dissolved in 120 ml of solution?

3. If a 0.075 liter solution contains 0.0877 moles of $CuCO_4$, what is the molarity?

4. How many moles of NaCl are present in 600. ml a 1.55 M NaCl solution?

5. How many moles of H_2SO_4 are present in 1.63 liters of a 0.954 M solution?

6. How many liters of solution are needed to make a 1.66 M solution containing 2.11 moles of $KMnO_{4?}$

7. What volume of a 0.25 M solution can be made using 0.55 moles of $Ca(OH)_2$?

For all of the problems below you will need to do a mole-mass conversion. Each problem will involve two steps.

8. What is the molarity in 650. ml of solution containing 63 grams of NaCl?

9. How many grams of $Ca(OH)_2$ are needed to produce 500. ml of 1.66 M $Ca(OH)_2$ solution?

10. What volume of a 0.88 M solution can be made using 130. grams of $FeCl_2$?

Answers: (done quickly; there may be errors)

1. 1.7 M
2. 2.41 M
3. 1.2 M
4. 0.930 moles
5. 1.56 moles
6. 1.27 L
7. 2.2 L
8. 1.7 M
9. 61.5 grams
10. 1.2 L

Dilution Problems Worksheet

1. How do you prepare a 250.-ml of a 2.35 M HF dilution from a 15.0 M stock solution?

2. If 455-ml of 6.0 M HNO_3 is used to make a 2.5 L dilution, what is the molarity of the dilution?

3. If 65.5 ml of HCl stock solution is used to make 450.-ml of a 0.675 M HCl dilution, what is the molarity of the stock solution?

4. How do you prepare 500.-ml of a 1.77 M H_2SO_4 dilution from an 18.0 M H_2SO_4 stock solution?

Answers:
1. 39.2-ml (Put in paragraph form)
2. 1.1 M
3. 4.64 M
4. 49.2-ml

   Take 49.2-ml of 18.0 M H_2SO_4 stock solution and pour it into a 500-ml volumetric flask. Fill to the 500-ml line with distilled water to make 1.77M H_2SO_4 solution.

Extra Molarity Problems for Practice

1. How many moles of LiF would be required to produce a 2.5 M solution with a volume of 1.5 L?

2. How many moles of $Sr(NO_3)_2$ would be used in the preparation of 2.50 L of a 3.5 M solution?

3. What is the molarity of a 500-ml solution containing 249 g of KI?

4. How many grams of $CaCl_2$ would be required to produce a 3.5 M solution with a volume of 2.0 L?

Answers:
1. 3.75 M
2. 8.75 M
3. 3.00 M
4. 7.8 x 10^2g