Molarity

Molarity is just a unit of concentration that indicates how much solute we have in a solution. It is defined as shown below.

$$M = \frac{\text{mols of solute}}{1 \,\text{L of solution}}$$

Thus, we need to remember the definitions of solute, solvent and solution:

solute: the substance dissolved in a solvent to form a solution; it is normally the component of a solution present in the smaller amount

solvent: the dissolving medium of a solution; it is normally the component of a solution present in the greater amount

solution: a mixture of substances that has a uniform composition; a homogeneous mixture

So, let's get some practice with this new unit!

Convert the following Molarity expressions into a conversion factor. The first one is done as an example.



Now, let's try to do some calculations with Molarity! Remember to always write out M as the mol/L so you can see all the units.

7. How many moles of NaCl are in 2.50 liters of 6.45 M NaCl?

 $\frac{6.45 \text{ mols NaCl}}{1 \text{ L NaCl}} \times 2.50 \text{ L NaCl} = 16.1 \text{ mols NaCl}$

- 8. How many moles of HCl are in 0.54 liters of 10.2 M HCl?
- 9. How many liters of NaOH are in 1.3 moles of 3.42 M NaOH?