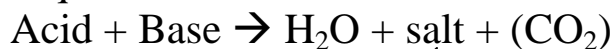


## Titration Problem Steps

1. Write and balance the equation



Salt forms from positive  
ion from base and  
negative ion from acid.  
Charge should add to  
zero

(CO<sub>2</sub> only forms if base  
is a carbonate)

2. Use molarity (M) and volume (L) of the acid or base to find the moles of that acid or base.  $M \times V(L) = \text{moles}$

3. Use the coefficients from the balanced equation to find moles of the unknown acid or base.

$$\text{moles unknown} = (\text{moles known}) \left( \frac{\text{unknown coefficient}}{\text{known coefficient}} \right)$$

4. Use the moles you have just determined to find either a molarity or mass %

Mass % (purity)	Molarity
<p>Moles known (from step 3) x Molar mass of unknown = Mass of unknown</p> <p style="text-align: center;">↓</p> <p><math>\left( \frac{\text{mass of unknown}}{\text{mass of impure sample}} \right) \times 100 = \% \text{ purity}</math></p>	<p><math>\frac{\text{Moles known (from step 3)}}{\text{Volume (L) of unknown}} = \text{Molarity}</math></p>

- Volumes must be in liters (L). Divide mL by 1000 to convert to L.