Salt Preparation

- Tip: Remember your solubility table

Soluble	Insoluble
All Grp I & NH_4^+	
All NO_3^-	
All Cl^-, Br^-	Ag^+, Pb^{2+}
All SO_4^{2-}	Pb^{2+}, Ba^{2+}, Ca^{2+}
Grp I, NH_4^+	All CO_3^{2-}, OH^-, O^{2-} except (look at left)

- There are 3 methods of preparation
- Tip: You need to know all the steps required for each method

Precipitation

- Aqueous + Aqueous -> solid
- This means this method is for **<u>insoluble salts</u>**

1. Add both aqueous compounds together
2. Filter the mixture with a filter funnel lined with filter paper. Collect the precipitate as residue
3. Rinse the residue with distilled water to remove soluble impurities
4. Press-dry the residue between filter papers

Acid + Excess insoluble base/carbonate

- To form **<u>soluble salts that are not grp I or ammonium salts</u>**
- Concept: By adding excess insoluble base/carbonate, all the acid would react, and the mixture would only have the soluble salt + excess insoluble base/carbonate
    - Filter to separate our the soluble salt as filtrate

1. Pipette acidic solution into a flask
2. Add the insoluble base/carbonate with stirring. Keep adding until the base or carbonate does not react anymore and remains insoluble
    a. This is the sign where all the acid has reacted.
3. Filter the mixture with filter funnel lined with filter paper and collect the Salt as the filtrate
4. Heat the Solution to saturation
5. Cool for Crystals to form
6. Filter the crystals in the solution with filter funnel lined with filter paper, collect the salt crystals as the residue
7. Wash the crystals with little cold deionised water
8. Press-dry the crystals between filter paper

Titration

- To form **<u>Grp I or ammonium salts</u>**
- Concept: If you are forming a Grp I or ammonium salt, the cation is Grp I or NH_4^+ and so you cannot use the excess insoluble carbonate/base method
    - You need an 'exactly measured' reaction to ensure the produced salt has no excess reactants/impurities
- These are acid+alkali reactions

1. Pipette acidic solution into flask
2. Pour the alkaline solution into a burette
3. Add the methyl orange indicator into the flask
    a. (you can use any indicator so adapt to the question, I always use methyl orange as it's the easiest to remember)
4. Titrate the acidic solution with the alkaline solution until the methyl orange indicator changes color from orange to yellow. Record the burette reading.
    a. Notice how you should mention the exact colour change of the indicator
    b. This is the point of full neutralisation
    c. Don't forget that this is just to get the exact measurement of alkali needed to react with the acid in the flask fully
        i. You need to repeat this to get a salt not contaminated with indicator
5. Repeat the titration, steps 1-4, but without the indicator, and using the same volumes of acid and alkali that were used in the original titration.
6. Heat the Solution to saturation
7. Cool for Crystals to form
8. Filter the crystals in the solution with filter funnel lined with filter paper, collect the salt crystals as the residue
9. Wash the crystals with little cold deionised water
10. Press-dry the crystals between filter paper

- Notice how steps 6-10 are similar with the previous method of salt preparation with acid + excess insoluble carbonate/base