

Do now:

What are the lab rules we should follow in F4 when carrying out a lab?

Groups for today:

1. Codie and William
2. Ezra and Tasneef
3. Clinton and Divyesh
4. Serge and Simeon
5. Tausili and Isi
6. Shane and Jaybour
7. Tamrat and Immanuel
8. Syed, Nick and Ehsan
9. Daniel and Treymane
10. Kyle and Xavier

Lab rules

- No eating/no drinking
- Safety glasses on
- Wash hands when leaving
- Bags under desk
- Walking only/no running
- No drinking chemicals
- Follow instructions

A practise...

iron(III) chloride + sodium hydroxide	
Observations	orange precipitate forms
Full equation	$\text{FeCl}_3 + 3\text{NaOH} \rightarrow \text{Fe(OH)}_3 + 3\text{NaCl}$
Precipitate formed	Fe(OH)_3
Net ionic equation	

Do now:

Complete your lab worksheet from yesterday, filling in the top three boxes for all reactions.

If you have done this double check that you and your pair yesterday have the correct formula written down for all compounds.

Learning Objectives

- Write equations for the dissolution of ionic compounds in water
- Identify spectator ions and write equations for reactions that do not include the spectator ions

Writing net ionic equations

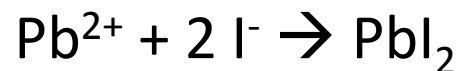
How can we represent in an equation what occurs when an ionic compound dissolves or precipitates?

We write net ionic equations, showing only the ions involved in dissolving or precipitating.

For example: NaCl dissolves in water

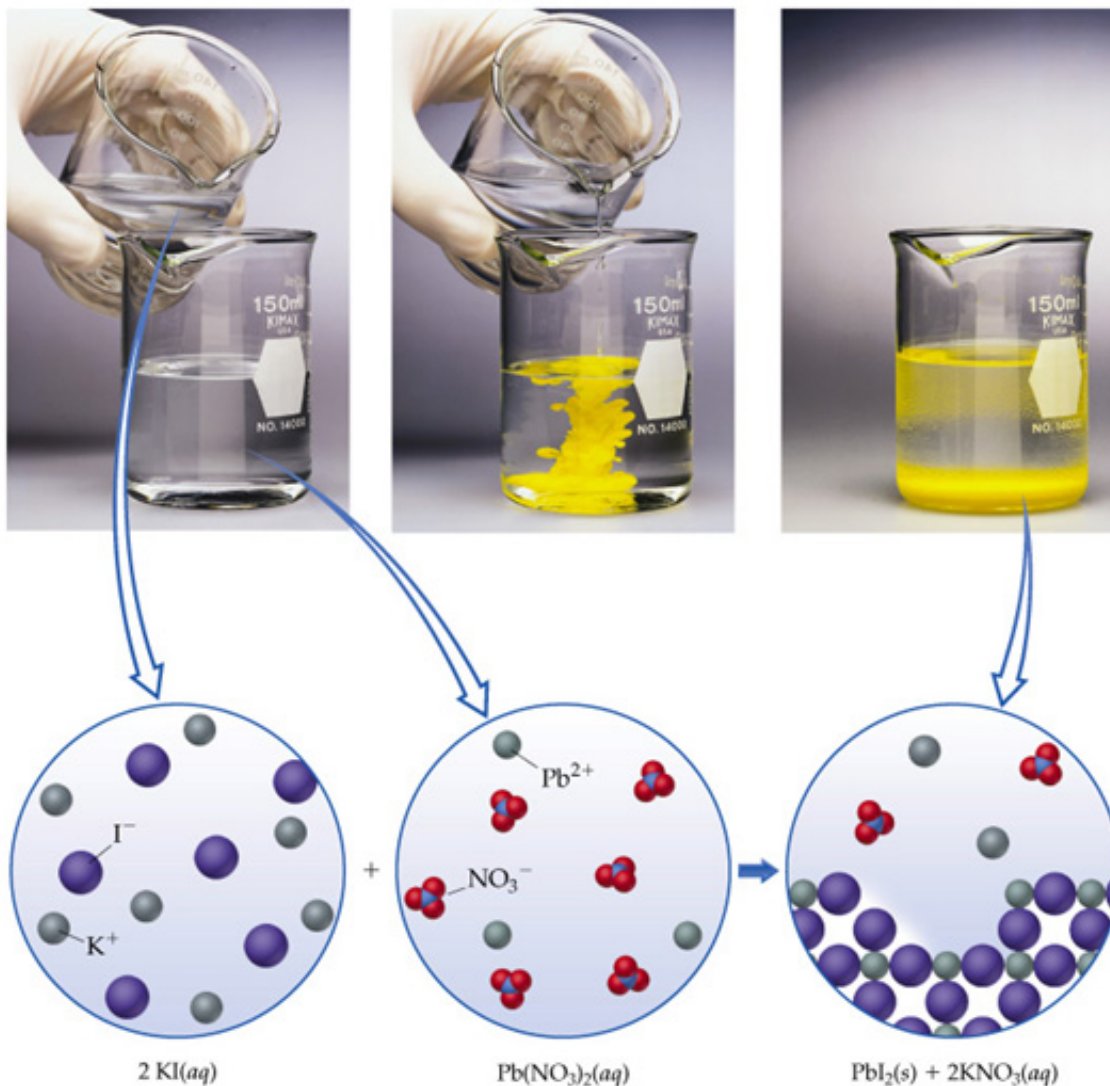


For example: Lead iodide precipitates from water



Writing net ionic equations

When we write net ionic equations for precipitation reactions we only write down the ions that are involved, the ions that stay in solution are called **spectator ions**.

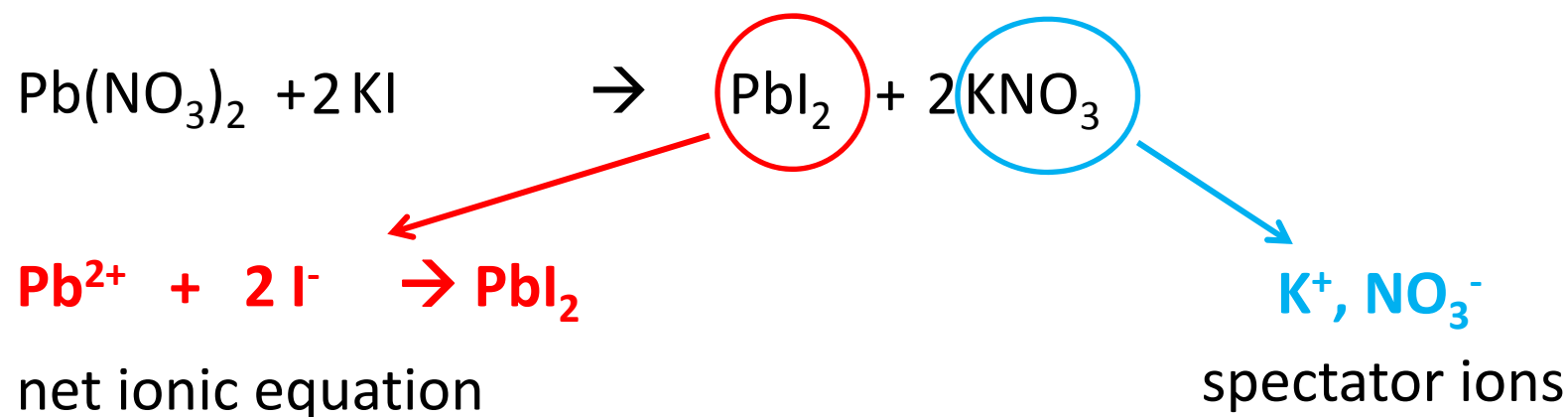


Writing net ionic equations

The balanced equations we need to write to get M or E are net **ionic equations** not the equations we have been practising!

We need to write equations just showing the ions involved in making the precipitate.

For example:



Writing net ionic equations

In your lab handout from yesterday there is a section for writing the net ionic equation for the precipitation.

To get M and E every time you see a precipitate forming you need to write a net ionic equation for the formation of the precipitate.

Lets do the first one from your lab handout together...

Writing net ionic equations

iron(II) sulfate + sodium hydroxide	
Observations	Green precipitate forms
Full equation	$\text{FeSO}_4 + 2 \text{NaOH} \rightarrow \text{Fe(OH)}_2 + \text{Na}_2\text{SO}_4$
Precipitate formed	Fe(OH)_2
Net ionic equation	$\text{Fe}^{2+} + 2 \text{OH}^- \rightarrow \text{Fe(OH)}_2$

iron(III) chloride + sodium hydroxide	
Observations	orange precipitate forms
Full equation	$\text{FeCl}_3 + 3 \text{NaOH} \rightarrow \text{Fe(OH)}_3 + 3 \text{NaCl}$
Precipitate formed	Fe(OH)_3
Net ionic equation	$\text{Fe}^{3+} + 3 \text{OH}^- \rightarrow \text{Fe(OH)}_3$

Using hydrochloric and sulfuric acid

When we use hydrochloric and sulfuric acid in precipitation reactions we are adding them for the anions in the acid (Cl^- and SO_4^{2-}) not for the acidic properties.

Identify the precipitate formed for the following reactions and write the net ionic equation if a precipitate does form.

Pb^{2+} SO_4^{2-}
Lead nitrate and sulfuric acid

Precipitate is: lead sulfate PbSO_4

Net ionic equation: $\text{Pb}^{2+} + \text{SO}_4^{2-} \rightarrow \text{PbSO}_4$

Silver nitrate and hydrochloric acid

Ag^+ Cl^-

Precipitate is: silver chloride AgCl

Net ionic equation: $\text{Ag}^+ + \text{Cl}^- \rightarrow \text{AgCl}$

Using hydrochloric and sulfuric acid

Predict if a precipitate will form, if so write the precipitate formed and the net ionic equation.

Calcium nitrate and sulfuric acid $\text{Ca}^{2+} + \text{SO}_4^{2-} \rightarrow \text{CaSO}_4$

Copper sulfate and hydrochloric acid

Barium chloride and sulfuric acid $\text{Ba}^{2+} + \text{SO}_4^{2-} \rightarrow \text{BaSO}_4$

Iron(II) chloride and sodium hydroxide $\text{Fe}^{2+} + 2 \text{OH}^- \rightarrow \text{Fe}(\text{OH})_2$

Copper sulfate and potassium hydroxide $\text{Cu}^{2+} + 2 \text{OH}^- \rightarrow \text{Cu}(\text{OH})_2$

Lead nitrate and sodium chloride $\text{Pb}^{2+} + 2 \text{Cl}^- \rightarrow \text{PbCl}_2$

Calcium chloride and sodium carbonate $\text{Ca}^{2+} + \text{CO}_3^{2-} \rightarrow \text{CaCO}_3$

Aluminium nitrate and sodium hydroxide $\text{Al}^{3+} + \text{OH}^- \rightarrow \text{Al}(\text{OH})_3$

Sodium sulfate and barium nitrate $\text{Ba}^{2+} + \text{SO}_4^{2-} \rightarrow \text{BaSO}_4$