

# What forms a precipitate?

Check each step,  
**in order.**

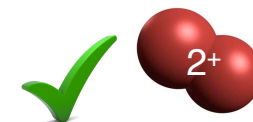
Solubility Rules  
you are  
responsible for.

**Soluble**

no precipitate

**Insoluble**

forms precipitate



$\text{Hg}_2^{2+}$   
mercury (I) ion



$\text{Hg}^{2+}$   
mercury (II) ion

**Step 1**

ANIONS

Acetates ( $\text{OAc}^{-1}$  or  $\text{CH}_3\text{COO}^{-1}$ )  
Nitrates ( $\text{NO}_3^{-1}$ )

Always

Never

**Step 2**

CATIONS

Ammonium ( $\text{NH}_4^{+1}$ )  
Alkali metal ( $\text{Na}^{+1}$ ,  $\text{Li}^{+1}$ ,  $\text{K}^{+1}$ ...)  
Acids (the ones we learned)

Always

Never

**Step 3**

ANIONS

Carbonates ( $\text{CO}_3^{2-}$ )  
Phosphates ( $\text{PO}_4^{3-}$ )

Never

Always

**Step 4**

has  
exceptions

ANIONS

Halogens ( $\text{Cl}^{-1}$ ,  $\text{Br}^{-1}$ ,  $\text{I}^{-1}$ ,  $\text{F}^{-1}$ )

Usually

Except:  
 $\text{Ag}^{+}$ ,  
 $\text{Hg}_2^{2+}$  or  $\text{Pb}^{2+}$

Sulfates ( $\text{SO}_4^{2-}$ )

Usually

$\text{Hg}_2^{2+}$  or  $\text{Pb}^{2+}$   
 $\text{Sr}^{2+}$ ,  $\text{Ba}^{2+}$

Sulfides ( $\text{S}^{2-}$ )

Hydroxy Salts ( $\text{OH}^{-1}$ )

Except:  
 $\text{Sr}^{2+}$ ,  $\text{Ba}^{2+}$ ,  
 $\text{Ca}^{2+}$

Usually

If you remember 1-3 you'll be good 85% of the time

If you remember 1-3 and 4 you'll be good 95%

Remembering the exceptions isn't that hard

— there's only **silver** ions that cause exceptions

and **lead**, **mercury**, and **silver** are the most commonly encountered ones.

