

You can use your book and your notes if you wish. You **cannot** work on this assignment with a friend.

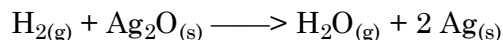
Simple Rules for the Solubility of Salts in Water (From Zumdahl, Chemistry, 3e)

1. Most nitrate (NO_3^-) salts are soluble.
2. Most salts containing the alkali metal ions (Li^+ , Na^+ , K^+ , Cs^+ , Rb^+) and the ammonium ion (NH_4^+) are soluble.
3. Most chloride, bromide and iodide salts are soluble. Notable exceptions are salts containing the ions Ag^+ , Pb^{2+} , and Hg_2^{2+} .
4. Most sulfate salts are soluble. Notable exceptions are BaSO_4 , PbSO_4 , HgSO_4 , and CaSO_4 .
5. Most hydroxide salts are only slightly soluble. The important soluble hydroxides are NaOH and KOH . The compounds $\text{Ba}(\text{OH})_2$, $\text{Sr}(\text{OH})_2$, and $\text{Ca}(\text{OH})_2$ are marginally soluble.
6. Most sulfide (S^{2-}), carbonate (CO_3^{2-}), chromate (CrO_4^{2-}), and phosphate (PO_4^{3-}) are only slightly soluble.

1. a. Determine the concentration of Cl^- in 35 mL of a 0.500 M MgCl_2 .

b. 25.0 mL of a 0.350 M NaCl solution are added to 35.0 mL of a 0.500 M MgCl_2 solution. Assuming the volumes are additive, determine the concentration of Cl^- in M.

2. Silver oxide can be removed from silver using H_2 . The following equation describes the reaction.



Is this an oxidation-reduction reaction? What is being oxidized, how many electrons are moved from what element to what element?

3. 0.3400 g $\text{Sr}(\text{NO}_3)_2$ are placed in a 250.0-mL volumetric flask. Water is added so that the volume is 250.0 mL. What is the concentration, in M, of the solution?
4. Lead ions react with iodide to form lead(II) iodide. How many grams of NaI are required to precipitate all of the lead from 25.0 mL of a 3.5 M lead(II) nitrate solution as lead(II) iodide.
- a. balanced equation
- b. Grams of NaI
5. 44.30 mL of a 0.100 M NaOH solution are required to neutralize 0.5649 g of an unknown diprotic acid. Determine the molar mass of the diprotic acid?
6. Identify the products of the following reactions and write balanced chemical equations. If no reaction occurs, write NR.
1. $\text{H}_2\text{SO}_4(\text{aq}) + \text{Mg}(\text{OH})_2(\text{s}) \rightarrow$
2. $\text{BaCl}_2(\text{aq}) + \text{Pb}(\text{NO}_3)_2(\text{aq}) \rightarrow$
3. $\text{K}_2\text{SO}_4(\text{aq}) + \text{NaCl}(\text{aq}) \rightarrow$
4. $3 \text{NaOH}(\text{aq}) + \text{H}_3\text{PO}_4(\text{aq}) \rightarrow$
- 5.(Hint: a violent reaction that releases gas occurs)
 $\text{Na}(\text{s}) + \text{HCl}(\text{aq}) \rightarrow$
6. $\text{HNO}_3(\text{aq}) + \text{NaCl}(\text{aq}) \rightarrow$