W-GC General Chemistry Week 20 2/7
Double Replacement Reactions
Reactants Products
AB + CD AD + CB Cation Panion BO BO O O O O O O O O O O O
"salts - sionic compound
Ionic compounds break down in an aqueous
environment Na IIII C)
Nacl = table salt Nacl = table salt Nacl = Nat + Cl = H & Na + So H Nacl = Nat + Cl = H & Na + H ionize
Water molecules break down ist of HST and surrounds sight of HST and surrounds of HC 10 HST of
charge A-8 H-0 H 8 H 4 H 7 St O St
Water Surrounds-
THE HALL H

 $A-B+C-D \rightleftharpoons A-D+C-B$ breaks down solid A + B + C + D (ay) (5)Sanaci + Ksoy Nasoy + 2Kci

NR) -> because no

precipitate formed.

solid that does not

dissolve in water. Single Replacement A + BC ---

You can/should use this Solubility Rules on tests \(\frac{1}{3} \) quizzes.

Whether or not a reaction forms a precipitate is dictated by the solubility rules. These rules provide guidelines that tell which ions form solids and which remain in their ionic form in aqueous solution. The rules are to be followed from the top down, meaning that if something is insoluble (or soluble) due to rule 1, it has precedence over a higher-numbered rule.

- Soluble means break down in war in the soluble in t
 - 2. Acetates (C₂H₃O₋₂C₂H₃O₂-), nitrates (NO₋₃NO₃-), and perchlorates (ClO₋₄ClO₄-) are **soluble**.
 - 3. Bromides, chlorides, and iodides are **soluble**.
 - 4. Sulfates (SO₂-4SO₄2-) are **soluble** with the exception of sulfates formed with Ca₂+Ca₂+, Sr₂+Sr₂+, and Ba₂+Ba₂+.
 - 5. Salts containing silver, lead, and mercury (I) are **insoluble**.
 - 6. Carbonates (CO₂-3CO₃2-), phosphates (PO₃-4PO₄3-), sulfides, oxides, and hydroxides (OH-OH-) are **insoluble**. Sulfides formed with group 2 cations and hydroxides formed with calcium, strontium, and barium are exceptions.

If the rules state that an ion is soluble, then it remains in its aqueous ion form. If an ion is insoluble based on the solubility rules, then it forms a solid with an ion from the other reactant. If all the ions in a reaction are shown to be soluble, then no precipitation reaction occurs.

Pb(NO3) cag) + 2LiBrag) = PbBrz +2LiNO3
(ag) (Lead (II)) nitrate (Litium bromide)

Pb+2 + 2Ato3 2Lin + 2Bro 2Lin + 2Ato3 "spectator ion" NR - No reaction Because it-does not form a solid No insolubility. Mg Clz cags + 2Na OH cags Mg(OH)2 + 2Naclago 1) Double replacement (2) Stoichmoich 3) Neview solubility rules (4) Eliminate spectator ions Mg Cl₂ (ag) + 2NaOH (ag) \longrightarrow Mg (OH)₂ (s) + 2Na + 2Cl \longrightarrow insoluble

Mg⁺² + 2Cl + 2Na + 2OH \longrightarrow Mg (OH)₂ (s) + 2Na + 2Cl \longrightarrow Mg (OH)₂ (s) + 2Na + 2Cl \longrightarrow Mg(OH)2(s) + 2 Nat + 2(10 Net Reactin: TMg+2+ 20H0 -> Mg (OH)2 (5)