**WODSS SCIENCE** Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SCH 4CI Date:\_\_\_\_\_\_\_\_\_\_\_

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| **Key Terms Needed For the Unit 2 Evaluation**  You should know the definitions for each of these key terms and be able to use them correctly when talking about chemistry. | | |
| \_\_  solubility | \_\_  aqueous solution | \_\_  precipitate |
| \_\_  spectator ion | \_\_  net ionic equation | \_\_  total ionic equation |
| \_\_  word equation | \_\_  skeleton equation | \_\_  balanced chemical equation |
| \_\_  complete combustion | \_\_  incomplete combustion |  |
| **Types of Chemical Equations** | | |
| synthesis reaction      A + B --->  AB | | |
| decomposition reaction   AB ---> A  +  B  combustion reaction Metal + O2 ---> metal oxide non-metal + O2 ---> dioxide  complete combustion: CxHy + O2 ---> CO2 + H2O  incomplete combustion: CxHy + O2 ---> CO2 + H2O + C + CO etc. | | |
| single displacement reaction   A  + BC ----->   B  + AC | | |
| double displacement reaction    AB  +  CD   ---->  AD  +   CB | | |
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| **Problems You Should Be Able To Solve:** | | |
| * Identify different types of chemical reactions * Write word equations * Write balanced chemical equations * Predict the formation of a precipitate * Write total ionic equations and net ionic equations   **Review**   1. Complete assigned textbook questions (pg 53 #1-8, pg 57 #1, pg 62 #1-2, pg 72 #19-22)   Page 53:  1. (a) Decomposition (b) Synthesis (c) Decomposition  2. 2H2(g) + O2(g) 🡪 2H2O(l)  3. When oxygen is one of the reactants and there is only one product then the reaction would be considered both synthesis and combustion.  2H2(g) + O2(g) 🡪 2H2O(l)  4. (a) Zn(s) + CuCl2(aq) 🡪 ZnCl2(aq) + Cu(s)  (b) Ca(s) + HCl(aq) 🡪 CaCl2(aq) + H2(g)  (c) 2 Na(s) + 2H2O(l) 🡪 2NaOH(aq) H2(g)  5. Synthesis- elements  Decomposition – compounds  Single displacement – element plus a compound  Double displacement – two compounds  6. They are considered opposite reactions because synthesis puts reactants together into a  compound while decomposition breaks a compound into smaller products.  7. (a) Al(s) + 3AgNO3(aq) 🡪 Al(NO3)3(aq) + 3Ag(s) SD  (b) Zn(s) + H2SO4(aq) 🡪 ZnSO4(aq) + H2(g) SD  (c) MgCl2(aq) + 2AgNO3(aq) 🡪 Mg(NO3)2(aq) + 2AgCl(s) DD  (d) 2 Na(s) + 2H2O(l) 🡪 2NaOH(aq) H2(g)  DD  (e) 3 KOH(aq) + FeCl3(aq) 🡪 Fe(OH)3(s) + 3 KCl(aq) DD  8. Li2O(s) 🡪 2Li(s) + O2(g)  2 MgO(s) 🡪 2Mg(s) + O2(g)  ZnCl2(s) 🡪 Zn(s) + Cl2(g)  Page 57  1. (a) Pb(NO3)2(aq ) + 2NaCl(aq) 🡪 PbCl2(aq) + 2NaNO3(aq)  (b) CaCl2(aq ) + Na2SO4(aq) 🡪 Ca SO4 (s ) + 2NaCl (aq)  (c) Mg(C2H3O2)2(aq ) + 2 AgNO3 (aq) 🡪 2 AgC2H3O2(s ) + Mg(NO3)2(aq)  (d) NaC2H3O2(aq ) +KCl(aq) 🡪 no reaction  Page 62  1. (a) insoluble (b) soluble (c) soluble (d) insoluble (e) insoluble  (f) soluble (g) insoluble  2. (a) Sr(NO3)2(aq) + Na2SO4(aq) 🡪 SrSO4(s) + NaNO3(aq) **SrSO4 is a precipitate**  (b) AgNO3(aq) + NaC2H3O2(aq) 🡪 Ag C2H3O2(s) + NaNO3 (aq) **AgC2H3O2 is a**  **precipitate**  (c) Ba(NO3)2(aq) + (NH4)3PO4(aq) 🡪 Ba3(PO4)2(s) + NH4NO3(aq) **Ba3(PO4)2 is a**  **precipitate**  (d) Ca(NO3)2(aq) + NaOH(aq) 🡪 Ca(OH)2(s) + NaNO3(aq) **Ca(OH)2  is a precipitate**  Page 72  19. (a) synthesis/combustion  (b) single displacement  (c) decomposition  (d) synthesis  (e) decomposition  20. reaction (a) because oxygen is one of the reactants  21. (a) NaCl(aq) + AgNO3(aq) 🡪 AgCl(s) + NaNO3(aq)  (b) CuCl2 (aq) + NaNO3(aq) 🡪 Cu(NO3)2(aq) + NaCl(aq) **NO REACTION**  (c) Na2S(aq) + Pb(NO3)2(aq) 🡪 PbS(s) + 2NaNO3(aq)  (d) KOH(aq) + NH4Cl(aq) 🡪 KCl(aq) + NH4OH(aq) **NO REACTION**  22. Na2S(aq) + Pb(NO3)2(aq) 🡪 PbS(s) + 2NaNO3(aq)  Total Ionic Equation: 2[Na]+!(aq) +[S]+2(aq) + [Pb]+2(aq) + [NO3]-!(aq)  🡪 PbS(s) + 2 [Na]+1(aq) +  2[NO3]-!(aq)  Net Ionic Equation: [S]+2(aq) + [Pb]+2(aq)  🡪 PbS(s)  Spectator ions: 2 [Na]+1(aq) + 2[NO3]-!(aq)   1. Classify each of the following reactions as a synthesis, decomposition, single displacement, or double displacement reaction and balance them:    1. \_\_\_ CaO(s) + \_\_\_ CO2(g) 🡪 \_\_\_ CaCO3(s)  S    2. \_\_\_ FeS(s) + \_\_2\_ HCl(aq) 🡪 \_\_\_FeCl2(aq) + \_\_\_H2S(s) DD    3. \_\_\_ Na2O(s) + \_\_\_ CO2(g) 🡪 \_\_\_ Na2CO3(s)  S    4. \_2\_\_ H2O(l) 🡪 \_2\_\_ H2(g) + \_\_\_ O2(g)  D    5. \_\_2\_ KCl(s) + \_3\_\_ O2(g) 🡪 \_\_2\_ KClO3(s)  S/C    6. \_\_\_ Fe(s) + \_\_\_ Cu(NO3)2(aq) 🡪 \_\_\_ Fe(NO3)2(aq) + \_\_\_ Cu(s)  SD    7. \_\_\_ Ba(ClO3)2(s) 🡪 \_\_\_ BaCl2(s) + \_\_3\_ O2(g)  D    8. \_\_\_ FeS(s) 🡪 \_\_\_ Fe(s) + \_\_\_ S(s)  D    9. \_\_\_ Cu(s) + \_\_2\_ AgNO3(aq) 🡪 \_\_2\_ Ag(s) + \_\_\_ Cu(NO3)2(aq)  SD    10. \_2\_\_ NaCl(aq) + \_\_\_ H2SO4(aq) 🡪 \_\_\_ Na2SO4(aq) + \_2\_\_ HCl(aq)  DD    11. \_\_\_ Ca(s) + \_\_2\_ H2O(l) 🡪 \_\_\_ Ca(OH)2(aq) + \_\_\_ H2(g)  SD 2. Using the solubility rules, determine whether each of the following compounds are soluble in water:    1. calcium sulfate **insoluble**    2. hydrogen sulfide **soluble**    3. sodium nitrate **soluble**    4. copper (II) chloride **soluble**    5. magnesium carbonate **insoluble**    6. sodium hydroxide **soluble** 3. Using the solubility rules, complete each of the following double displacement reaction equations. Make sure to balance the equations. Write total ionic and net equations for each reaction. If no reaction occurs, write NR. | | |
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* 1. Aqueous silver nitrate and potassium chloride

Total Ionic Equation: [K]+!(aq) +[Cl]-1(aq) + [Ag]+1(aq) + [NO3]-!(aq)  🡪 AgCl(s) + [Na]+1(aq)

+ [NO3]-!(aq)

Net Ionic Equation: [Cl]-1(aq) + [Ag]+1(aq)  🡪 AgCl(s)

Spectator ions: [K]+1(aq) + [NO3]-!(aq)

1. Aqueous lead (II) nitrate and potassium sulfide

Total Ionic Equation: [Pb]+2(aq) + [NO3]-!(aq)  + 2[K]+!(aq) +[S]+2(aq)  🡪 PbS(s) +

2[Na]+1(aq) + 2[NO3]-!(aq)

Net Ionic Equation: [S]+2(aq) + [Pb]+2(aq)  🡪 PbS(s)

Spectator ions: [Na]+1(aq) + [NO3]-!(aq)