Classifying Reactions and Balancing Chemical Equations

Name:_____

Date:_____

Instructions: Balance the following equations, indicating the state of each product and classify each reaction as:

C = combustion
S = synthesis
D = decomposition
SD = single displacement
DD = double displacement

Reaction Type

_____ 1. _____$Cu_{(s)}$ + _____ $O_{2(g)}$ → _____ $CuO_{(s)}$

_____ 2. ___$Al_{(s)}$ + ____ $HCl_{(aq)}$ → ___$AlCl_3$ + ___H_2

_____ 3. ___$(NH_4)_3PO_{4(aq)}$ + ___ $ZnCl_{2(aq)}$ → ___ $Zn_3(PO_4)_2$ + ____NH_4Cl

_____ 4. ___$H_{2(g)}$ + ____$Cl_{2(g)}$ → ___HCl

_____ 5. ___$SbH_{3(s)}$ → ___Sb + ___H_2

_____ 6. ___$AgNO_{3(aq)}$ + ___$H_2SO_{4\,(aq)}$ → ___Ag_2SO_4 + ___HNO_3

_____ 7. ___$CaCO_{3(s)}$ → ___ CaO + ___ CO_2

_____ 8. ___$Fe_{(s)}$ + ___$Cr(NO_3)_{3(aq)}$ → __$Fe\,(NO_3)_2$ + ___Cr

_____ 9. ___Na_2CO_3 + ___H_3PO_4 → ___Na_3PO_4 + ___H_2CO_3

_____ 10. ___As + ___O_2 → ___As_2O_3

_____ 11. ____$H_2O_{(l)}$ → _____H_2 + _____O_2

_____ 12. ___$Pb_3O_{4(s)}$ → ___PbO + ___O_2

_____ 13. _____ $C_3H_8(g)$ + ____$O_2(g)$ → ____H_2O + ____CO_2

_____ 14. ___$Mg_{(s)}$ + ___$HNO_{3(aq)}$ → ___$Mg(NO_3)_2$ + ___H_2

_____ 15. ___$O_{2(g)}$ → ___O_3

_____ 16. ___$H_2O_{2(aq)}$ → ___H_2O + ___O_2

Write a word equation and a balanced chemical equation for each of the following:

1. When sodium is heated in gaseous chlorine, table salt (sodium chloride) is produced.

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2. When calcium oxide is added to nitric acid, calcium nitrate and water are formed

3. Aluminum can be produced, along with water, by bubbling hydrogen gas through a mash of aluminum oxide.

4. In the upper atmosphere, ammonium sulfate particles are formed by the reaction of ammonia, sulfur trioxide and water.

5. One kind of rocket fuel (B_5H_9) burns to produce boron oxide and water vapour.
(Hints: What does burn mean? Assume boron acts as a metal with a 3+ charge to form boron oxide)