Chemical Equation Assignment

Write balanced chemical equations for each of the following:

 double replacement reaction between osmium(IV) chloride and sodium oxide

 $OsCl_4 + 2Na_2O \rightarrow OsO_2 + 4NaCl$

2. single replacement of the hydrogen in ammonia gas ($\rm NH_3$) by iodine to form $\rm NI_3$

 $2NH_3 + 3I_2 \rightarrow 3H_2 + 2NI_3$

3. decomposition of mercury(I) oxide

 $2Hg_2O \rightarrow 4Hg + O_2$

4. decomposition of calcium chlorate to form calcium chloride plus a common gas

 $Ca(ClO_3)_2 \rightarrow CaCl_2 + 3O_2$

5. a cationic single replacement between gold(III) cyanide and hydrogen gas

2Au(CN)₃ + 3H₂ → 6HCN + 2Au

6. the decomposition of ammonium nitrate to form nitrogen gas, oxygen gas and water

 $2NH_4NO_3 \rightarrow 2N_2 + O_2 + 4H_2O$

7. double replacement between osmium(VI) chloride and carbon dioxide

20sCl₆ + 3CO₂ → 20sO₃ + 3CCl₄

8. double replacement between sodium phosphate and calcium sulphate

 $2Na_3PO_4 + 3CaSO_4 \rightarrow Ca_3(PO_4)_2 + 3Na_2SO_4$

9. double replacement between iron(III) chloride and potassium carbonate

 $2FeCl_3 + 3K_2CO_3 \rightarrow Fe_2(CO_3)_3 + 6KCl$

10. single replacement between silver nitrate and zinc metal

 $2AgNO_3 + Zn \rightarrow Zn(NO_3)_2 + 2Ag$

11. single replacement between calcium chloride and oxygen gas

 $2CaCl_2 + O_2 \rightarrow 2CaO + 2Cl_2$

12. decomposition of sodium carbonate to form a sodium compound plus a common gas

 $Na_2CO_3 \rightarrow Na_2O + CO_2$

13. neutralization reaction between hydrochloric acid (HCl) and sodium hydroxide

HCl + NaOH \rightarrow NaCl + H₂O (HOH)

14. synthesis of sulphur(VI) oxide from sulphur(IV) oxide and oxygen gas

 $2SO_2 + O_2 \rightarrow 2SO_3$

15. synthesis of sulphuric acid $(\mathrm{H_2SO_4})$ from sulphur(VI) oxide and water

 $SO_3 + H_2O \rightarrow H_2SO_4$

16. a hydrocarbon with the formula $C_6 H_{14}$ is combusted with oxygen gas to form carbon dioxide and water

2C₆H₁₄ + 19O₂ → 12CO₂ + 14H₂O

17. single replacement between uranium(VI) fluoride and calcium

UF₆ + 3Ca → 3CaF₂ + U

18. double replacement between tin(II) chloride and potassium phosphate

 $3SnCl_2 + 2K_3PO_4 \rightarrow Sn_3(PO_4)_2 + 6KCl$

19. synthesis between yttrium and oxygen

 $4Y + 3O_2 \rightarrow 2Y_2O_3$

20. formation of magnesium hydroxide plus a gas from magnesium metal and water

Mg + $2H_2O \rightarrow Mg(OH)_2 + H_2$