Chemical Reactions Test Review

Use this review as a practice. These exact questions will not be asked, but the concepts reviewed here will be tested. Remember to make a cheat sheet that will help you on your test. You will get the periodic table and the polyatomic ion chart. This review will be a stamp grade. Be prepared to turn it in right before the test.

1. What is the law of conservation of mass?

   A scientific law that states that you cannot create or destroy matter. We see it in chemical reactions because the total mass of the reactants you start with must equal the total mass of the products you form in the reaction.

2. How does the law of conservation of mass apply to chemical reactions?

   The total mass of the reactants you start with must equal the total mass of the products you form. You cannot create more products then the reactants you started with. This means that the number of each type of atom must be equal on both sides of the reaction to follow the law of conservation of mass and that is why we balance chemical equations when they are written.

3. In the reaction for the formation of magnesium phosphide, you create 250 grams of magnesium phosphide. $Mg + P \rightarrow Mg_3P_2$ Use the law of conservation of mass to tell the mass of the reactants and explain how you know the mass of the reactants.

   The total mass of Mg + P on the reactant side must equal 250 g since you formed 250 g of magnesium phosphide.

Know the symbols for these things in chemical reactions.

4. Solid (s)
5. Liquid (l)
6. Aqueous solution (aq)
7. Gas (g)
8. Yields, or forms →
9. Heat was added $\xrightarrow{\Delta}$
10. Reversible reaction ⇌

Know the diatomic elements, and how to write them in a reaction. $H_2, N_2, O_2, F_2, Cl_2, Br_2, I_2$

Be able to identify reaction types. *(Writing the generic forms may help you identify types, A + B → AB is synthesis.)*

11. $HCl + Zn \rightarrow ZnCl_2 + H_2$ Single Replacement
12. $H_2CO_3 \rightarrow H_2O + CO_2$ Decomposition
13. $H_2SO_4 + KOH \rightarrow K_2SO_4 + H_2O$ Double-Replacement
14. $C_3H_8 + O_2 \rightarrow CO_2 + H_2O$ Decomposition
15. $Al + CuCl_2 \rightarrow AlCl_3 + Cu$ Single-Replacement
16. $H_2O_2 \rightarrow H_2O + O_2$ Decomposition
17. $HCl + KOH \rightarrow KCl + H_2O$ Double Replacement
18. $Mg + F_2 \rightarrow MgF_2$ Synthesis
19. What are the reactants and products of a complete combustion reaction? $C_xH_x + O_2 \rightarrow CO_2 + H_2O$
20. What are the reactants and products of an incomplete combustion reaction? $C_xH_x + O_2 \rightarrow CO + H_2O$

Be able to balance chemical reactions.

21. 1 CaO + 1 CO_2 → 1 $CaCO_3$ Already Balanced

22. 2 KNO_3 → 2 KNO_2 + 1 O_2

23. 2 $AgNO_3$ + 1 Cu → 1 $Cu(NO_3)_2$ + 2 Ag

24. 3 Mg + 2 H_3PO_4 → 1 $Mg_3(PO_4)_2$ + 3 H_2

25. 2 $AgNO_3$ + 1 $ZnCl_2$ → 2 $AgCl$ + 1 $Zn(NO_3)_2$

26. 1 CH_4 + 3 O_2 → 1 CO_2 + 2 H_2O

27. 2 $C_{10}H_{12}O$ + 25 O_2 → 20 CO_2 + 12 H_2O

Combustions are the hardest to balance... Start by making the H subscript on the reactants = the water coefficient on the product side, then Balance Carbon & save oxygen for Last.

Old information that is still relevant:

28. Which is a molecule and why? (NaCl or N_2O_5) → molecules are made from only Non-metals.

29. How would you name the following?

a. $Al(OH)_3$ Aluminum Hydroxide

b. SO_3 Sulfur trioxide

c. N_2O_5 dinitrogen pentoxide

d. $Ca_3(PO_4)_2$ Calcium Phosphate

e. Fe_2O_3 Iron(III) oxide

30. Write the following formulas.

a. Calcium oxide $Ca^{2+}\ O^{2-} \Rightarrow CaO$

b. Trinitrogen pentoxide N_3O_5

c. Magnesium sulfate $Mg^{2+}\ SO_4^{2-} \Rightarrow MgSO_4$

d. Phosphoric acid $H^+\ PO_4^{3-} \Rightarrow H_3PO_4\ (aq)$

31. Be able to translate a formula into words.

a. Hydrogen plus oxygen form water

$H_2 + O_2 \rightarrow H_2O$

b. Magnesium added to phosphoric acid forms magnesium phosphate and hydrogen.

$Mg + H_3PO_4 \rightarrow Mg_3(PO_4)_2 + H_2$

c. Write the synthesis reaction for the formation of NH_3

$H_2 + N_2 \rightarrow NH_3$

d. Write the single replacement reaction the occurs when you combine solid aluminum with iron (III) oxide. $Al_{(s)} + Fe_2O_3 \rightarrow Al_2O_3 + Fe$