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AP Chemistry – Balancing, Types & Reactions – 17

Name _____Per ___

Balance the following chemical reactions using coefficients only. Note that some are balanced as written. Indicate, to the left of the problem number, the type of chemical reaction. Use "S" for synthesis (aka combination), "D" for decomposition, "SD" for single displacement, "DD" for double displacement and "C" for combustion.

1. $C_7H_6O_2 + O_2 \rightarrow CO_2 + H_2O$
2. $Al + O_2 \rightarrow Al_2O_3$
3. $H_3AsO_4 \rightarrow As_2O_5 + H_2O$
4. $Al_2(SO_4)_3 + Ca(OH)_2 \rightarrow Al(OH)_3 + CaSO_4$
5. $Al + HCl \rightarrow AlCl_3 + H_2$

6. Determine the chemical formula of the product formed when the metallic element calcium combines with the nonmetallic element oxygen. Write a balanced chemical equation for the reaction.

7. Write a balanced chemical equation for the combustion of acetone in air.

8. Determine the molecular or formula mass of each of the following compounds:
a) dinitrogen monoxide

b) benzoic acid, $HC_7H_5O_2$

c) magnesium hydroxide

d) urea, $(NH_2)_2CO$

e) isopentyl acetate, $CH_3CO_2C_5H_{11}$

9. Calculate the percentage by mass of the indicated element in the following compounds:
a) carbon in ethyne, C_2H_2 a gas used in welding

b) hydrogen in ammonium sulfate, a substance used as a fertilizer

c) oxygen in ascorbic acid, $HC_6H_7O_6$, also known as Vitamin C

d) platinum in $PtCl_2(NH_3)_2$ a chemotherapy agent called cisplatin

e) carbon in the female hormone estradiol, $C_{18}H_{24}O_2$

f) carbon in capsaicin, $C_{18}H_{27}NO_3$ the compound that gives the hot taste to chili peppers

10. Calculate the following quantities:
a) mass, in grams of 2.50×10^{-2} moles of $MgCl_2$

b) number of moles of NH_4Cl in 76.5 g of this substance

c) number of molecules in 0.0772 moles of $HCHO_2$

d) number of NO_3^- ions in 4.88×10^{-3} moles $Al(NO_3)_3$