

Exam #2 - Chunk 1 Questions

$$1) 3.40 \text{ g NH}_3 \times \frac{1 \text{ mol NH}_3}{17.04 \text{ g NH}_3} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol NH}_3} \times \frac{4 \text{ atoms}}{1 \text{ molecule NH}_3} = \boxed{4.81 \times 10^{23} \text{ atoms}}$$

$$2) \text{CuCl}_2 + 2 \text{NaNO}_3 \rightarrow \text{Cu(NO}_3)_2 + 2 \text{NaCl}$$

$$20.0 \text{ g CuCl}_2 \times \frac{1 \text{ mol CuCl}_2}{134.45 \text{ g CuCl}_2} \times \frac{2 \text{ mol NaCl}}{1 \text{ mol CuCl}_2} \times \frac{58.44 \text{ g NaCl}}{1 \text{ mol NaCl}} = \boxed{17.39 \text{ g NaCl}}$$

$$3) 2 \text{H}_2\text{S} + 3 \text{O}_2 \rightarrow 2 \text{SO}_2 + 2 \text{H}_2\text{O}$$

$$8.20 \text{ mol SO}_2 \times \frac{2 \text{ mol H}_2\text{S}}{2 \text{ mol SO}_2} = \boxed{8.20 \text{ mol SO}_2}$$

$$4) 6.82 \text{ g H}_2\text{S} \times \frac{1 \text{ mol H}_2\text{S}}{34.09 \text{ g H}_2\text{S}} \times \frac{2 \text{ mol H}_2\text{O}}{2 \text{ mol H}_2\text{S}} \times \frac{18.02 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = \boxed{3.61 \text{ g H}_2\text{O}}$$

$$5) \text{CuCl}_2 + 2 \text{NaNO}_3 \rightarrow \text{Cu(NO}_3)_2 + 2 \text{NaCl}$$

$$20.0 \text{ g CuCl}_2 \times \frac{1 \text{ mol CuCl}_2}{134.45 \text{ g CuCl}_2} \times \frac{1 \text{ mol Cu(NO}_3)_2}{1 \text{ mol CuCl}_2} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol Cu(NO}_3)_2} = \boxed{8.96 \times 10^{22} \text{ molecules}}$$

$$6) 0.500 \text{ mol CuBr} \times \frac{143.45 \text{ g CuBr}}{1 \text{ mol CuBr}} = \boxed{71.73 \text{ g CuBr}}$$

$$7) 2 \text{KClO}_3 \rightarrow 2 \text{KCl} + 3 \text{O}_2$$

$$12.0 \text{ mol KClO}_3 \times \frac{3 \text{ mol O}_2}{2 \text{ mol KClO}_3} = \boxed{18 \text{ mol O}_2}$$

$$8) 2 \text{K} + \text{Cl}_2 \rightarrow 2 \text{KCl}$$

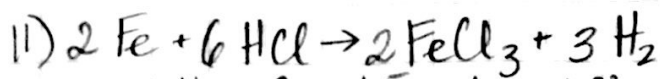
$$2.50 \text{ g K} \times \frac{1 \text{ mol K}}{39.01 \text{ g K}} \times \frac{2 \text{ mol KCl}}{2 \text{ mol K}} \times \frac{74.55 \text{ g KCl}}{1 \text{ mol KCl}} = \boxed{4.78 \text{ g KCl}}$$

$$9) 2 \text{KClO}_3 \rightarrow 2 \text{KCl} + 3 \text{O}_2$$

$$5.00 \text{ g KClO}_3 \times \frac{1 \text{ mol KClO}_3}{74.44 \text{ g KClO}_3} \times \frac{3 \text{ mol O}_2}{2 \text{ mol KClO}_3} \times \frac{32.00 \text{ g O}_2}{1 \text{ mol O}_2} = \boxed{3.22 \text{ g O}_2}$$

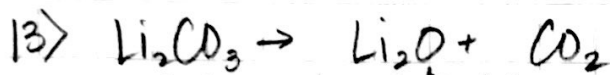
$$10) \text{Pb(SO}_4)_2 + 4 \text{LiNO}_3 \rightarrow \text{Pb(NO}_3)_4 + 2 \text{Li}_2\text{SO}_4$$

$$250 \text{ g Li}_2\text{SO}_4 \times \frac{1 \text{ mol Li}_2\text{SO}_4}{109.95 \text{ g Li}_2\text{SO}_4} \times \frac{4 \text{ mol LiNO}_3}{2 \text{ mol Li}_2\text{SO}_4} \times \frac{166.95 \text{ g LiNO}_3}{1 \text{ mol LiNO}_3} = \boxed{313.55 \text{ g LiNO}_3}$$

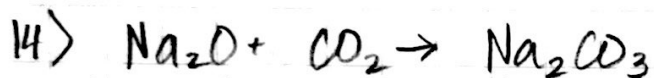


$$6 \text{ mol H}_2 \times \frac{2 \text{ mol Fe}}{3 \text{ mol H}_2} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol Fe}} = \boxed{2.41 \times 10^{24} \text{ molecules}}$$

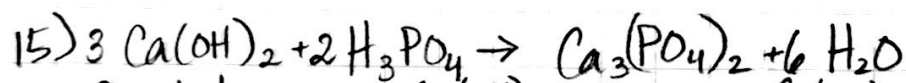
$$12) 7.0 \text{ mol HCl} \times \frac{3 \text{ mol H}_2}{6 \text{ mol HCl}} \times \frac{2.02 \text{ g H}_2}{1 \text{ mol H}_2} = \boxed{7.07 \text{ g H}_2}$$



$$2 \text{ mol CO}_2 \times \frac{1 \text{ mol Li}_2\text{CO}_3}{1 \text{ mol CO}_2} \times \frac{73.89 \text{ g Li}_2\text{CO}_3}{1 \text{ mol Li}_2\text{CO}_3} = \boxed{147.78 \text{ g Li}_2\text{CO}_3}$$



$$7 \text{ mol Na}_2\text{CO}_3 \times \frac{1 \text{ mol Na}_2\text{O}}{1 \text{ mol Na}_2\text{CO}_3} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol Na}_2\text{O}} = \boxed{4.21 \times 10^{24} \text{ molecules}}$$

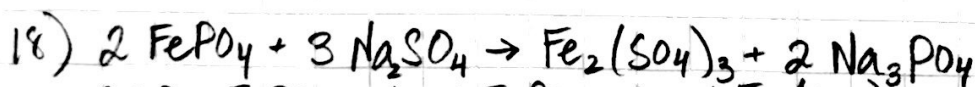


$$9 \text{ mol H}_2\text{O} \times \frac{3 \text{ mol Ca(OH)}_2}{6 \text{ mol H}_2\text{O}} \times \frac{74.10 \text{ g Ca(OH)}_2}{1 \text{ mol Ca(OH)}_2} = \boxed{333.45 \text{ g Ca(OH)}_2}$$



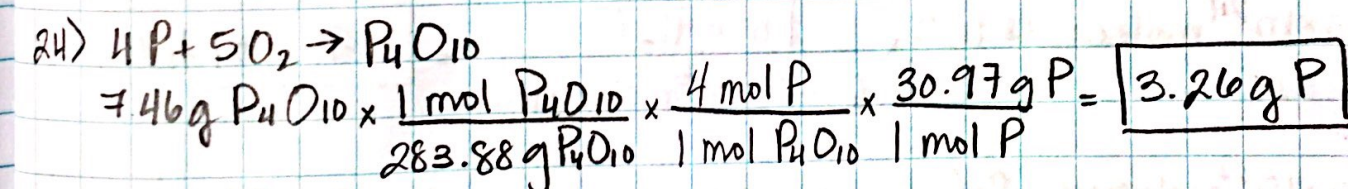
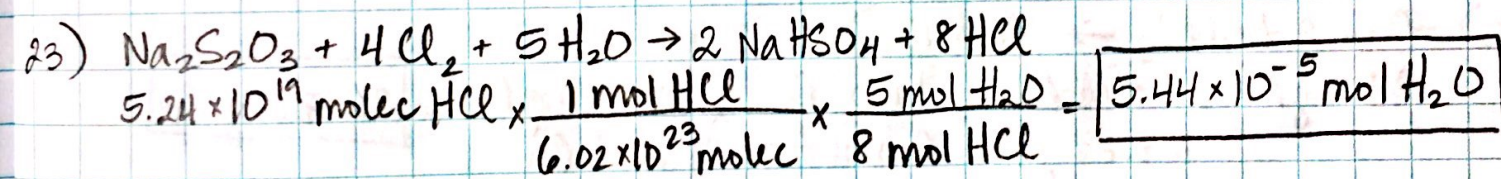
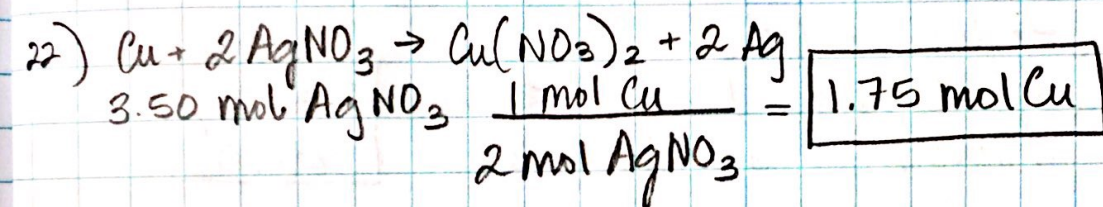
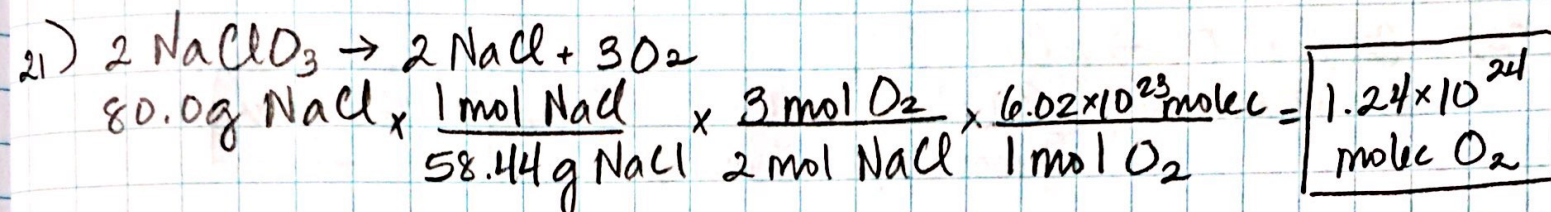
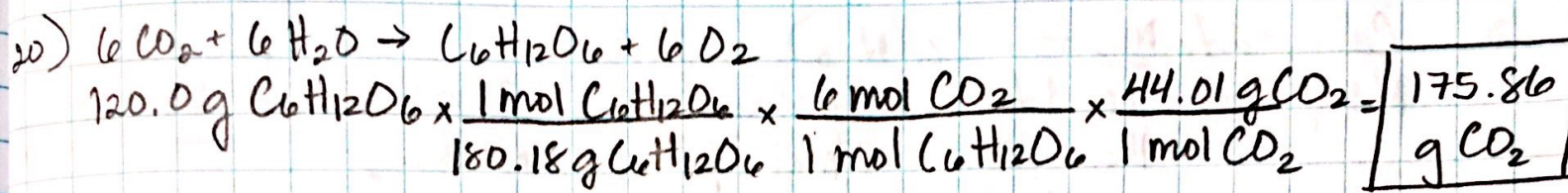
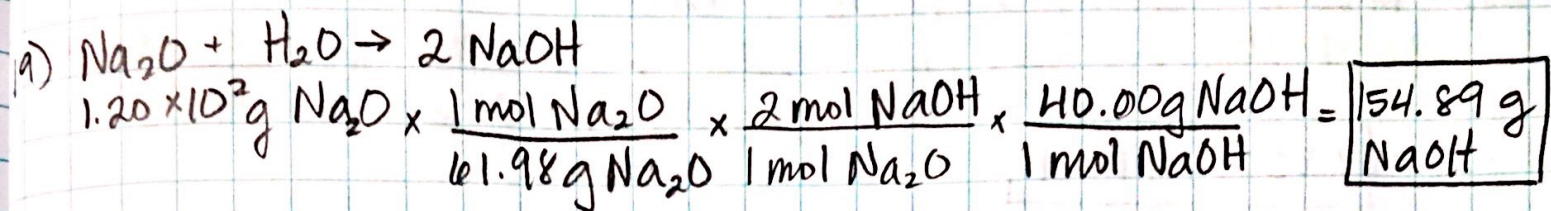
$$1.800 \times 10^{24} \text{ molec Cr}_2(\text{SO}_3)_3 \times \frac{1 \text{ mol Cr}_2(\text{SO}_3)_3}{6.02 \times 10^{23} \text{ molec}} \times \frac{3 \text{ mol H}_2\text{O}}{1 \text{ mol Cr}_2(\text{SO}_3)_3} \times \frac{18.02 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = \boxed{161.64 \text{ g H}_2\text{O}}$$

$$17) 30.00 \text{ g Cr}_2(\text{SO}_3)_3 \times \frac{1 \text{ mol Cr}_2(\text{SO}_3)_3}{344.21 \text{ g Cr}_2(\text{SO}_3)_3} \times \frac{3 \text{ mol H}_2\text{SO}_4}{1 \text{ mol Cr}_2(\text{SO}_3)_3} \times \frac{6.02 \times 10^{23} \text{ molec}}{1 \text{ mol H}_2\text{SO}_4} = \boxed{1.57 \times 10^{23} \text{ molec H}_2\text{SO}_4}$$

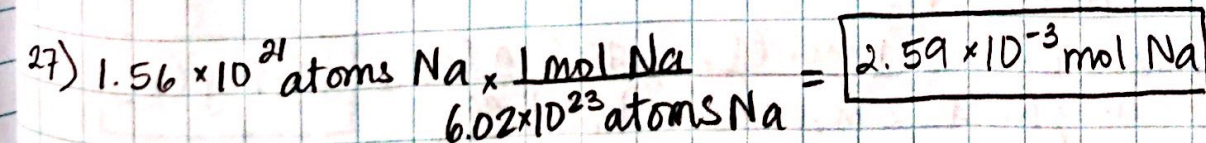
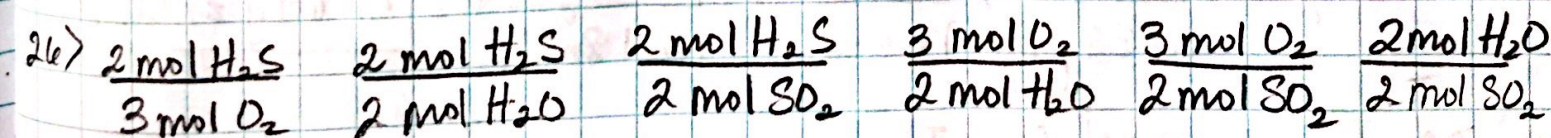
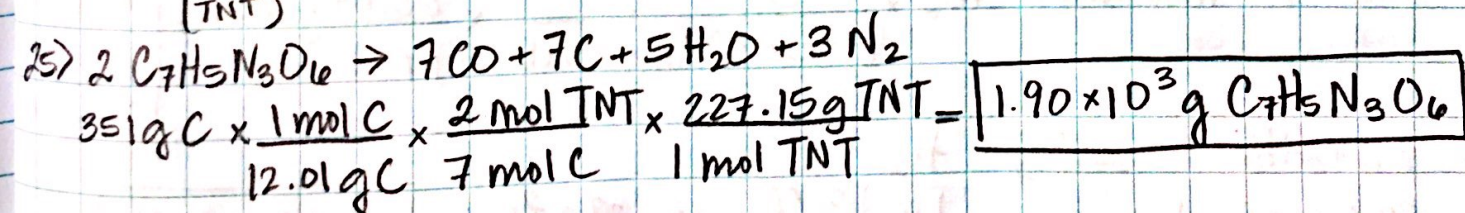


$$25.0 \text{ g FePO}_4 \times \frac{1 \text{ mol FePO}_4}{150.82 \text{ g FePO}_4} \times \frac{1 \text{ mol Fe}_2(\text{SO}_4)_3}{2 \text{ mol FePO}_4} \times \frac{399.91 \text{ g Fe}_2(\text{SO}_4)_3}{1 \text{ mol Fe}_2(\text{SO}_4)_3} = \boxed{33.14 \text{ g Fe}_2(\text{SO}_4)_3}$$

Exam #2 - Chunk 2 Questions



(TNT)



$$28) \text{Na}_2\text{CO}_3 + \text{Ca}(\text{OH})_2 \rightarrow 2\text{NaOH} + \text{CaCO}_3$$

$$1.000 \text{ kg Na}_2\text{CO}_3 \times \frac{1000 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ mol Na}_2\text{CO}_3}{105.99 \text{ g Na}_2\text{CO}_3} \times \frac{2 \text{ mol NaOH}}{1 \text{ mol Na}_2\text{CO}_3} \times \frac{40.00 \text{ g NaOH}}{1 \text{ mol NaOH}}$$

$$= \boxed{7.55 \times 10^2 \text{ g NaOH}}$$

$$29) \text{CaCl}_2 + 2\text{AgNO}_3 \rightarrow \text{Ca}(\text{NO}_3)_2 + 2\text{AgCl}$$

$$14.3 \text{ g AgCl} \times \frac{1 \text{ mol AgCl}}{143.32 \text{ g AgCl}} \times \frac{1 \text{ mol CaCl}_2}{2 \text{ mol AgCl}} \times \frac{110.98 \text{ g CaCl}_2}{1 \text{ mol CaCl}_2} = \boxed{5.54 \text{ g CaCl}_2}$$

$$30) \text{Cu}_2\text{S} + \text{O}_2 \rightarrow 2\text{Cu} + \text{SO}_2$$

$$0.6000 \text{ mol Cu}_2\text{S} \times \frac{2 \text{ mol Cu}}{1 \text{ mol Cu}_2\text{S}} \times \frac{63.55 \text{ g Cu}}{1 \text{ mol Cu}} = \boxed{76.26 \text{ g Cu}}$$

$$31) \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}$$

$$1.03 \times 10^{-2} \text{ mol O}_2 \times \frac{1 \text{ mol C}_6\text{H}_{12}\text{O}_6}{6 \text{ mol O}_2} \times \frac{180.18 \text{ g C}_6\text{H}_{12}\text{O}_6}{1 \text{ mol C}_6\text{H}_{12}\text{O}_6} = \boxed{\begin{matrix} 0.309 \text{ g} \\ \text{C}_6\text{H}_{12}\text{O}_6 \end{matrix}}$$

$$32) \text{Cu} + 2\text{AgNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + 2\text{Ag}$$

$$89.5 \text{ g Ag} \times \frac{1 \text{ mol Ag}}{107.87 \text{ g Ag}} \times \frac{1 \text{ mol Cu}}{2 \text{ mol Ag}} \times \frac{63.55 \text{ g Cu}}{1 \text{ mol Cu}} = \boxed{26.36 \text{ g Cu}}$$

$$33) 2.35 \times 10^{24} \text{ molecules H}_2\text{O} \times \frac{1 \text{ mol H}_2\text{O}}{6.02 \times 10^{23} \text{ molecules}} = \boxed{3.90 \text{ mol H}_2\text{O}}$$

$$34) 5.60 \times 10^{22} \text{ molecules SiO}_2 \times \frac{1 \text{ mol SiO}_2}{6.02 \times 10^{23} \text{ molecules}} \times \frac{60.09 \text{ g SiO}_2}{1 \text{ mol SiO}_2} = \boxed{5.59 \text{ g SiO}_2}$$

$$35) \text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$$

$$20.0 \text{ g Zn} \times \frac{1 \text{ mol Zn}}{65.39 \text{ g Zn}} \times \frac{1 \text{ mol ZnCl}_2}{1 \text{ mol Zn}} \times \frac{136.29 \text{ g ZnCl}_2}{1 \text{ mol ZnCl}_2} = \boxed{41.69 \text{ g ZnCl}_2}$$

$$36) 2\text{NaI} + \text{Cl}_2 \rightarrow 2\text{NaCl} + \text{I}_2$$

$$10.0 \text{ g NaCl} \times \frac{1 \text{ mol NaCl}}{58.44 \text{ g NaCl}} \times \frac{1 \text{ mol Cl}_2}{2 \text{ mol NaCl}} \times \frac{70.90 \text{ g Cl}_2}{1 \text{ mol Cl}_2} = \boxed{6.07 \text{ g Cl}_2}$$