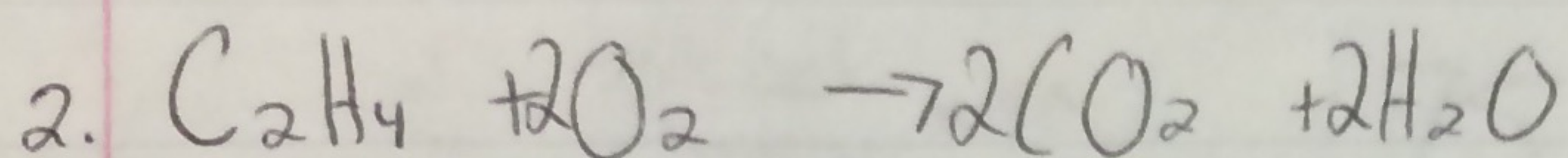
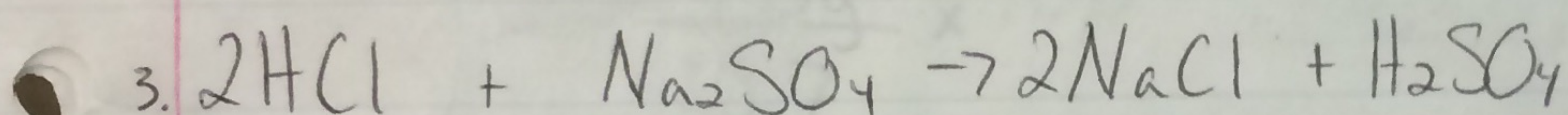


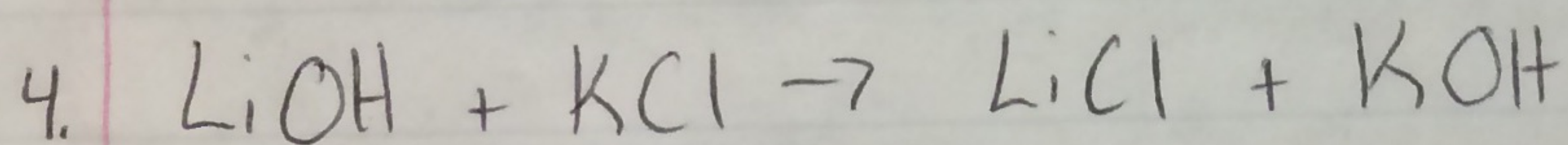
$$10\text{g LiOH} \times \frac{1\text{mol LiOH}}{23.94\text{g}} \times \frac{1\text{mol LiBr}}{1\text{mol LiOH}} \times \frac{86.845}{1\text{mol LiBr}} = \boxed{36.3\text{g LiBr}}$$



$$45\text{g C}_2\text{H}_4 \times \frac{1\text{mol C}_2\text{H}_4}{28\text{g}} \times \frac{2\text{mol CO}_2}{1\text{mol C}_2\text{H}_4} \times \frac{44\text{g}}{1\text{mol CO}_2} = \boxed{141\text{g CO}_2}$$



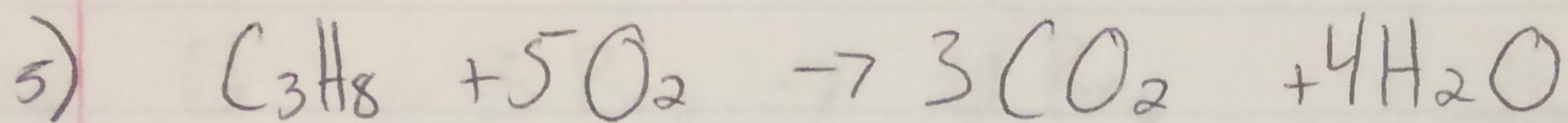
$$20\text{g HCl} \times \frac{1\text{mol HCl}}{36.45\text{g}} \times \frac{1\text{mol H}_2\text{SO}_4}{2\text{mol HCl}} \times \frac{98\text{g}}{1\text{mol H}_2\text{SO}_4} = \boxed{26.9\text{g H}_2\text{SO}_4}$$



$$20\text{g LiOH} \times \frac{1\text{mol LiOH}}{23.94\text{g}} \times \frac{1\text{mol LiCl}}{1\text{mol LiOH}} \times \frac{42.39\text{g}}{1\text{mol LiCl}} = \boxed{35.41\text{g LiCl}}$$

$$\% = \frac{\text{actual}}{\text{theory}} \times 100 = \frac{6\text{g}}{35.4\text{g}} \times 100 = \boxed{16.9\%}$$

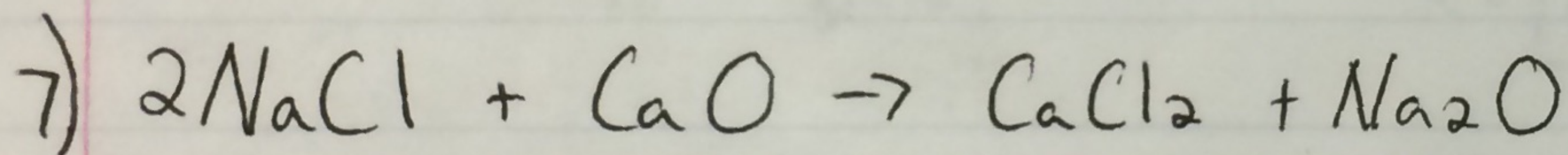
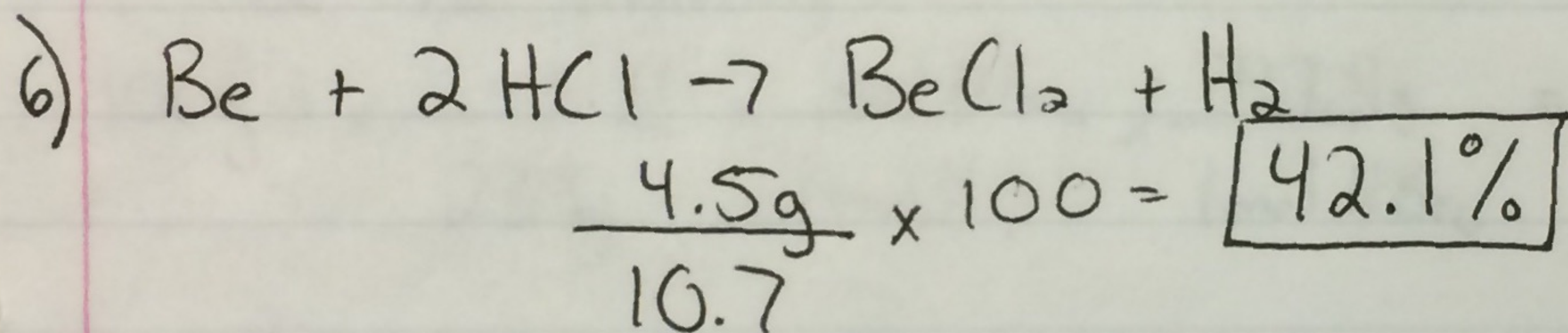




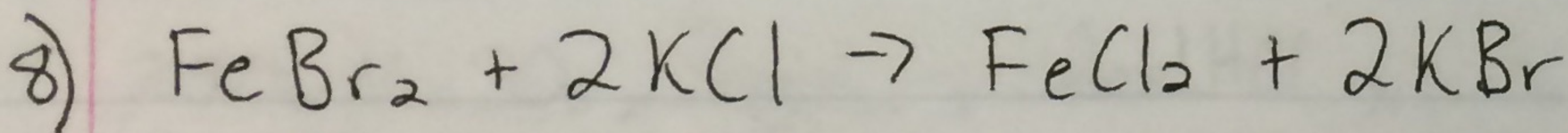
$$5\text{g C}_3\text{H}_8 \times \frac{1\text{mol C}_3\text{H}_8}{44\text{g}} \times \frac{4\text{mol H}_2\text{O}}{1\text{mol C}_3\text{H}_8} \times \frac{18\text{g}}{1\text{mol H}_2\text{O}} = \boxed{8.2\text{g}}$$

$$b. \quad \% \frac{\text{actual}}{\text{theory}} \times 100 \quad 75\% = \frac{x}{8.2\text{g}} \times 100$$

$$x = \boxed{6.15\text{g H}_2\text{O}}$$

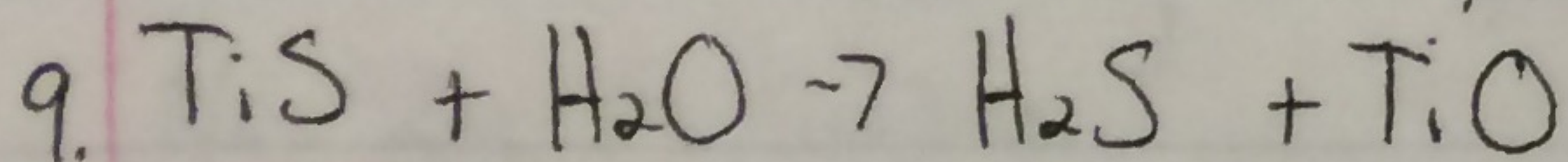


$$20\text{g CaO} \times \frac{1\text{mol CaO}}{56.1\text{g}} \times \frac{1\text{mol Na}_2\text{O}}{1\text{mol CaO}} \times \frac{62\text{g}}{1\text{mol Na}_2\text{O}} = \boxed{22.1\text{g Na}_2\text{O}}$$



$$34\text{g FeBr}_2 \times \frac{1\text{mol FeBr}_2}{215.6\text{g}} \times \frac{1\text{mol FeCl}_2}{1\text{mol FeBr}_2} \times \frac{126.74\text{g}}{1\text{mol FeCl}_2} = 20.\text{g FeCl}_2$$

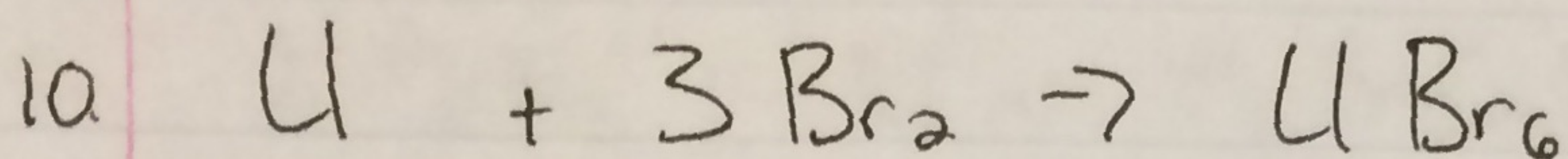
$$\% = \frac{\text{actual}}{\text{theory}} = \frac{4}{20} \times 100 = \boxed{20\%}$$



$$20\text{g TiS} \times \frac{1\text{mol TiS}}{79.867\text{g}} \times \frac{1\text{mol TiO}}{1\text{mol TiS}} \times \frac{63.867\text{g}}{1\text{mol TiO}} = 15.99\text{g}$$

$$\frac{20\text{g}}{15.99\text{g}} \times 100 = \boxed{138\%}$$





	H	N
* U	100g	124.1g
Br <sub>2</sub>	250g	201.4g

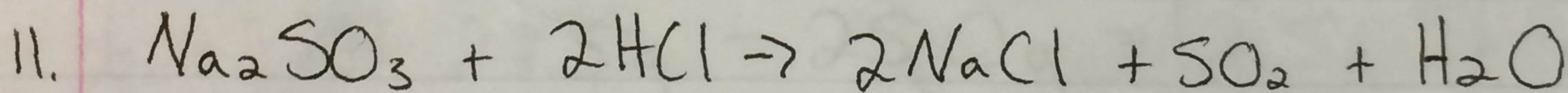
$$100g U \times \frac{1 \text{ mol } U}{238g U} \times \frac{3 \text{ mol } Br_2}{1 \text{ mol } U} \times \frac{159.8g}{1 \text{ mol } Br_2} = 201.4g Br_2$$

$$250g Br_2 \times \frac{1 \text{ mol } Br_2}{159.8g} \times \frac{1 \text{ mol } U}{3 \text{ mol } Br_2} \times \frac{238g}{1 \text{ mol } U} = 124.1g U$$

U is limiting

$$100g U \times \frac{1 \text{ mol } U}{238g} \times \frac{1 \text{ mol } U Br_6}{1 \text{ mol } U} \times \frac{717.4g}{1 \text{ mol } U Br_6} = 301.4g \text{ theoretical yield}$$

$$83\% = \frac{x}{301.4g} \times 100 \quad x = \boxed{250.2g U Br_6}$$



	H	N
* Na <sub>2</sub> SO <sub>3</sub>	25.0g	38.0g
HCl	22.0g	14.5g

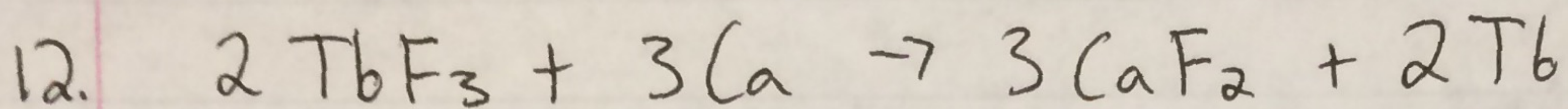
$$25.0g Na_2SO_3 \times \frac{1 \text{ mol}}{126g} \times \frac{2 \text{ mol } HCl}{1 \text{ mol } Na_2SO_3} \times \frac{36.46g}{1 \text{ mol } HCl} = \boxed{14.46g HCl}$$

$$22g HCl \times \frac{1 \text{ mol } HCl}{36.46g} \times \frac{1 \text{ mol } Na_2SO_3}{2 \text{ mol } HCl} \times \frac{126g}{1 \text{ mol } Na_2SO_3} = \boxed{38.0g Na_2SO_3}$$

Na<sub>2</sub>SO<sub>3</sub> is limiting.

$$25.0g \times \frac{1 \text{ mol } Na_2SO_3}{126g} \times \frac{1 \text{ mol } SO_2}{1 \text{ mol } Na_2SO_3} \times \frac{64g}{1 \text{ mol } SO_2} = \boxed{12.7g SO_2}$$





	H	N
TbF <sub>3</sub>	27.5g	25.00g
* Ca	6.96g	7.65g *

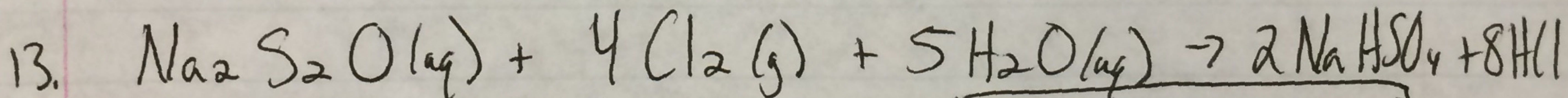
$$27.5 \text{g TbF}_3 \times \frac{1 \text{mol TbF}_3}{215.914 \text{g}} \times \frac{3 \text{mol Ca}}{2 \text{mol TbF}_3} \times \frac{40.07 \text{g}}{1 \text{mol Ca}} = 7.65 \text{g Ca}$$

$$6.96 \text{g Ca} \times \frac{1 \text{mol Ca}}{40.07 \text{g}} \times \frac{2 \text{mol TbF}_3}{3 \text{mol Ca}} \times \frac{215.914 \text{g}}{1 \text{mol TbF}_3} = 25.00 \text{g}$$

Ca is limiting

a.  $6.96 \text{g Ca} \times \frac{1 \text{mol Ca}}{40.07 \text{g}} \times \frac{2 \text{mol Tb}}{3 \text{mol Ca}} \times \frac{158.93 \text{g}}{1 \text{mol Tb}} = \boxed{18.4 \text{g Tb}}$

b.  $\text{27.5g} - 25.0 \text{g} = \boxed{2.5 \text{g TbF}_3 \text{ left}}$



a.  $.12 \text{mol Cl}_2 \times \frac{1 \text{mol Na}_2\text{S}_2\text{O}_3}{4 \text{mol Cl}_2} = \boxed{.03 \text{mol Na}_2\text{S}_2\text{O}_3}$

b.  $.12 \text{mol Cl}_2 \times \frac{8 \text{mol HCl}}{4 \text{mol Cl}_2} = \boxed{.24 \text{mol HCl}}$

c.  $.12 \text{mol Cl}_2 \times \frac{5 \text{mol H}_2\text{O}}{4 \text{mol Cl}_2} = \boxed{.15 \text{mol H}_2\text{O}}$

d.  $.24 \text{mol HCl} \times \frac{5 \text{mol H}_2\text{O}}{8 \text{mol HCl}} = \boxed{.15 \text{mol H}_2\text{O}}$