



$$\cancel{\text{Have}} \left(\frac{52.0\text{g C}_2\text{H}_2}{1} \right) \left(\frac{1 \text{ mole C}_2\text{H}_2}{26.0\text{g C}_2\text{H}_2} \right) \left(\frac{5 \text{ mole O}_2}{2 \text{ mole C}_2\text{H}_2} \right) \left(\frac{32.0\text{g O}_2}{1 \text{ mole O}_2} \right) = 160.0\text{g O}_2$$

Need

Convert L to g

$$\left(\frac{125\text{L O}_2}{1} \right) \left(\frac{1 \text{ mole O}_2}{22.4\text{L O}_2} \right) \left(\frac{32.0\text{g O}_2}{1 \text{ mole O}_2} \right) = 179\text{g O}_2$$

Need 160.0g O₂, Have 179g O₂ so

O₂ is EXCESS
& C₂H₂ is Limiting

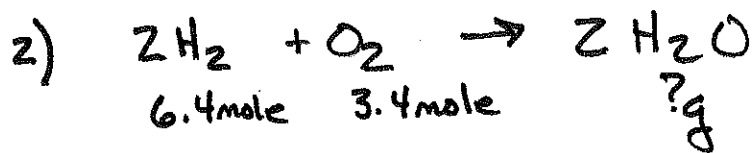
Have 179g O₂
Need 160.0g O₂

19g O₂ EXCESS

Start w/ Limiting

$$\left(\frac{52.0\text{g C}_2\text{H}_2}{1} \right) \left(\frac{1 \text{ mole C}_2\text{H}_2}{26.0\text{g C}_2\text{H}_2} \right) \left(\frac{4 \text{ mole CO}_2}{2 \text{ mole C}_2\text{H}_2} \right) \left(\frac{44.0\text{g CO}_2}{1 \text{ mole CO}_2} \right) = 176\text{g CO}_2$$

$$\left(\frac{52.0\text{g C}_2\text{H}_2}{1} \right) \left(\frac{1 \text{ mole C}_2\text{H}_2}{26.0\text{g C}_2\text{H}_2} \right) \left(\frac{2 \text{ mole H}_2\text{O}}{2 \text{ mole C}_2\text{H}_2} \right) \left(\frac{18.0\text{g H}_2\text{O}}{1 \text{ mole H}_2\text{O}} \right) = 36.0\text{g H}_2\text{O}$$

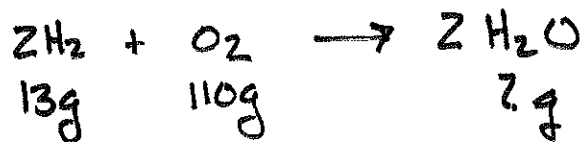


? g Excess

change to grams

$$\left(\frac{6.4 \text{ moles H}_2}{1}\right) \left(\frac{2.0 \text{ g H}_2}{1 \text{ mole H}_2}\right) = 13 \text{ g H}_2$$

$$\left(\frac{3.4 \text{ mole O}_2}{1}\right) \left(\frac{32.0 \text{ g O}_2}{1 \text{ mole O}_2}\right) = 110 \text{ g O}_2$$



Have

$$\left(\frac{13 \text{ g H}_2}{1}\right) \left(\frac{1 \text{ mole H}_2}{2.0 \text{ g H}_2}\right) \left(\frac{1 \text{ mole O}_2}{2 \text{ mole H}_2}\right) \left(\frac{32.0 \text{ g O}_2}{1 \text{ mole O}_2}\right) = 100 \text{ g O}_2 \text{ Need}$$

Need 100g O₂, have 110g O₂

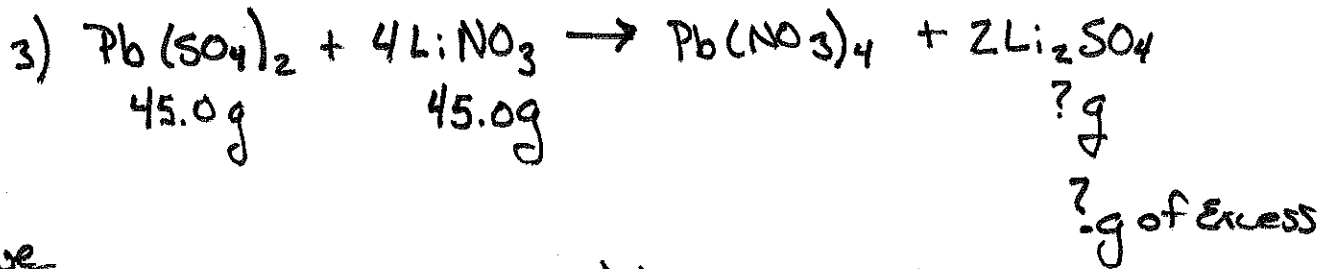
110 g O₂ Have
100 g O₂ Needed

10 g O₂ Excess

so O₂ Excess
H₂ Limiting

? g H₂O → start w/ Limiting

$$\left(\frac{13 \text{ g H}_2}{1}\right) \left(\frac{1 \text{ mole H}_2}{2.0 \text{ g H}_2}\right) \left(\frac{2 \text{ mole H}_2\text{O}}{2 \text{ mole H}_2}\right) \left(\frac{18.0 \text{ g H}_2\text{O}}{1 \text{ mole H}_2\text{O}}\right) = \boxed{120 \text{ g H}_2\text{O}}$$



Have

$$\left(\frac{45.0\text{g Pb}(\text{SO}_4)_2}{1} \right) \left(\frac{1\text{mole Pb}(\text{SO}_4)_2}{399.4\text{g Pb}(\text{SO}_4)_2} \right) \left(\frac{4\text{mole LiNO}_3}{1\text{mole Pb}(\text{SO}_4)_2} \right) \left(\frac{68.9\text{g LiNO}_3}{1\text{mole LiNO}_3} \right)$$

= 31.1g LiNO₃ needed

Need 31.1g LiNO₃, Have 45.0g LiNO₃ so

45.0g LiNO₃ Have
31.1g LiNO₃ Needed

13.9g LiNO₃ EXCESS

LiNO₃ Excess
Pb(SO₄) Limiting

$$\left(\frac{13.9\text{g LiNO}_3}{1} \right) \left(\frac{1\text{mole LiNO}_3}{68.9\text{g LiNO}_3} \right) = 0.20\text{mole LiNO}_3\text{ EXCESS}$$

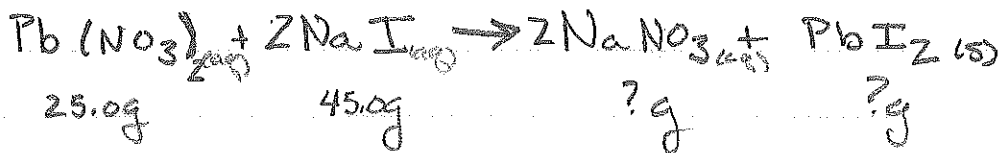
0.20 mole
LiNO₃
EXCESS

Product start w/ Limiting

$$\left(\frac{45.0\text{g Pb}(\text{SO}_4)_2}{1} \right) \left(\frac{1\text{mole Pb}(\text{SO}_4)_2}{399.4\text{g Pb}(\text{SO}_4)_2} \right) \left(\frac{2\text{mole Li}_2\text{SO}_4}{1\text{mole Pb}(\text{SO}_4)_2} \right) \left(\frac{109.9\text{g Li}_2\text{SO}_4}{1\text{mole Li}_2\text{SO}_4} \right)$$

= 24.8g Li₂SO₄

4)



$$\left(\frac{25.0g \text{ Pb(NO}_3)_2}{1} \right) \left(\frac{1 \text{ mole Pb(NO}_3)_2}{331.2g \text{ Pb(NO}_3)_2} \right) \left(\frac{2 \text{ mole NaI}}{1 \text{ mole Pb(NO}_3)_2} \right) \left(\frac{149.9g \text{ NaI}}{1 \text{ mole NaI}} \right) = 22.6g \text{ NaI needed}$$

45.0g NaI have

22.6g NaI needed

22.4 g NaI Excess

Pb(NO₃)₂ Limiting

Find Products start w/ Limiting

$$\left(\frac{25.0g \text{ Pb(NO}_3)_2}{1} \right) \left(\frac{1 \text{ mole Pb(NO}_3)_2}{331.2g \text{ Pb(NO}_3)_2} \right) \left(\frac{2 \text{ mole NaNO}_3}{1 \text{ mole Pb(NO}_3)_2} \right) \left(\frac{85.0g \text{ NaNO}_3}{1 \text{ mole NaNO}_3} \right) = 12.8g \text{ NaNO}_3$$

$$\left(\frac{25.0g \text{ Pb(NO}_3)_2}{1} \right) \left(\frac{1 \text{ mole Pb(NO}_3)_2}{331.2g \text{ Pb(NO}_3)_2} \right) \left(\frac{1 \text{ mole PbI}_2}{1 \text{ mole Pb(NO}_3)_2} \right) \left(\frac{461.0g \text{ PbI}_2}{1 \text{ mole PbI}_2} \right) = 34.8g \text{ PbI}_2$$