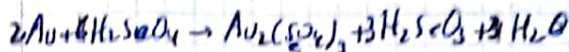


PART 4 PROBLEMS SOL

(m) $2,16 \rightarrow 1,3,3$

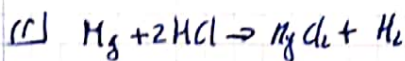


$$1\text{g Au} \times \frac{1\text{mol Au}}{197\text{g}} \times \frac{6\text{mol H}_2\text{SO}_4}{2\text{mol Au}} \times \frac{1\text{L}}{2\text{mol H}_2\text{SO}_4} = 7,61 \cdot 10^{-3}\text{L} = 7,61\text{mL}$$

(n)

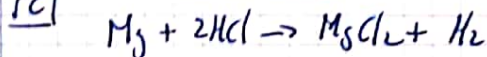


$$0,540\text{g CaCO}_3 \times \frac{1\text{mol CaCO}_3}{100,1\text{g}} \times \frac{2\text{mol HCl}}{1\text{mol CaCO}_3} \times \frac{1\text{L}}{0,1\text{mol HCl}} = 0,1078\text{L} = 107,89\text{mL}$$



$$0,25\text{L HCl} \times \frac{0,5\text{mol HCl}}{1\text{L}} \times \frac{1\text{mol Mg}}{2\text{mol HCl}} \times \frac{24,3\text{g}}{1\text{mol Mg}} = 1,52\text{g}$$

(s)

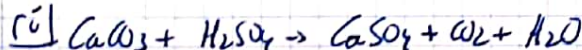


$$25^\circ\text{C} = 298\text{K}; 700\text{mmHg} = 0,921\text{atm}$$

$$0,25\text{L HCl} \times \frac{0,5\text{mol HCl}}{1\text{L}} \times \frac{1\text{mol H}_2}{2\text{mol HCl}} = 0,0625\text{mol H}_2$$

$$V = \frac{nRT}{P} = \frac{0,0625 \cdot 0,082 \cdot 298}{0,921} = 1,66\text{L}$$

(t)

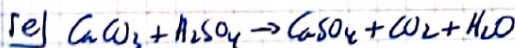


$$10\text{g CaCO}_3 \times \frac{1\text{mol CaCO}_3}{100,1\text{g}} \times \frac{1\text{mol H}_2\text{SO}_4}{1\text{mol CaCO}_3} \times \frac{98\text{g H}_2\text{SO}_4}{1\text{mol H}_2\text{SO}_4} = 9,79\text{g H}_2\text{SO}_4$$

$$9,79\text{g H}_2\text{SO}_4 \times \frac{100\text{g soln}}{96\text{g H}_2\text{SO}_4} \times \frac{1\text{mL}}{1,84\text{g}} = 5,54\text{mL}$$

$$9,79\text{g H}_2\text{SO}_4 \times \frac{100\text{g soln}}{96\text{g H}_2\text{SO}_4} \times \frac{1\text{mL}}{1,84\text{g}} = 5,54\text{mL}$$

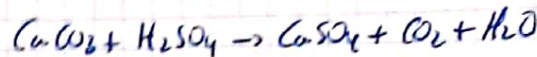
(u)



$$10\text{mL} \times \frac{1,84\text{g}}{1\text{mL}} \times \frac{96\text{g H}_2\text{SO}_4}{100\text{g}} \times \frac{1\text{mol H}_2\text{SO}_4}{98\text{g}} \times \frac{1\text{mol CaSO}_4}{1\text{mol H}_2\text{SO}_4} \times \frac{136,1\text{g}}{1\text{mol CaSO}_4} = 24,53\text{g}$$

$$10\text{mL} \times \frac{1,84\text{g}}{1\text{mL}} \times \frac{96\text{g H}_2\text{SO}_4}{100\text{g}} \times \frac{1\text{mol H}_2\text{SO}_4}{98\text{g}} \times \frac{1\text{mol CaSO}_4}{1\text{mol H}_2\text{SO}_4} \times \frac{136,1\text{g}}{1\text{mol CaSO}_4} = 24,53\text{g}$$

(v)

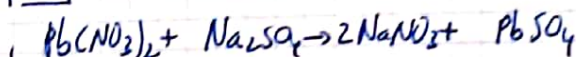


$$10\text{mL H}_2\text{SO}_4 \times \frac{1,84\text{g}}{1\text{mL}} \times \frac{96\text{g}}{100\text{g}} \times \frac{1\text{mol H}_2\text{SO}_4}{98\text{g}} \times \frac{1\text{mol CO}_2}{1\text{mol H}_2\text{SO}_4} = 0,18\text{mol CO}_2$$

$$V = \frac{nRT}{P} = \frac{0,18 \cdot 0,082 \cdot 273}{1} = 4,03\text{L}$$

$$V = \frac{nRT}{P} = \frac{0,18 \cdot 0,082 \cdot 273}{1} = 4,03\text{L}$$

(w)



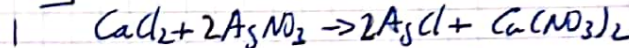
REACTIVO LIMITANTE

$$0,450\text{g Na}_2\text{SO}_4 \times \frac{1\text{mol Na}_2\text{SO}_4}{142\text{g}} \times \frac{1\text{mol Pb}(\text{NO}_3)_2}{1\text{mol Na}_2\text{SO}_4} = 3,17 \cdot 10^{-3}\text{moles}$$

$$M = \frac{3,17 \cdot 10^{-3}\text{moles}}{0,5\text{L}} = 6,34 \cdot 10^{-3}\text{M}$$

$$M = \frac{3,17 \cdot 10^{-3}\text{moles}}{0,5\text{L}} = 6,34 \cdot 10^{-3}\text{M}$$

(x)



$$15 \cdot 10^{-3}\text{L} \times \frac{0,3\text{mol CaCl}_2}{1\text{L}} = 4,5 \cdot 10^{-3}\text{moles CaCl}_2$$

$$4,5 \cdot 10^{-3}\text{moles CaCl}_2 \times \frac{2\text{mol AgNO}_3}{1\text{mol CaCl}_2} = 9 \cdot 10^{-3}\text{mol AgNO}_3$$

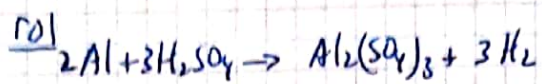
$$30 \cdot 10^{-3}\text{L} \times \frac{0,05\text{mol AgNO}_3}{1\text{L}} = 1,5 \cdot 10^{-3}\text{mol AgNO}_3$$

$$1,5 \cdot 10^{-3}\text{mol AgNO}_3 \times \frac{1\text{mol CaCl}_2}{2\text{mol AgNO}_3} = 7,5 \cdot 10^{-4}\text{mol CaCl}_2$$

REACTIVO LIMITANTE $\Rightarrow \text{AgNO}_3$ $1,5 \cdot 10^{-3}\text{mol}$

$$1,5 \cdot 10^{-3}\text{mol AgNO}_3 \times \frac{2\text{mol AgCl}}{2\text{mol AgNO}_3} \times \frac{143,4\text{g}}{1\text{mol AgCl}} = 0,215\text{g}$$

$$= 0,215\text{g}$$



$$64g \times \frac{1 \text{ mol Al}}{27g} = 2,37 \text{ mol Al}$$

$$2,37 \text{ mol Al} \times \frac{3 \text{ mol } H_2SO_4}{2 \text{ mol Al}} = 3,56 \text{ mol } H_2SO_4$$

$$1,5L \times \frac{2 \text{ mol } H_2SO_4}{1L} = 3 \text{ mol } H_2SO_4$$

$$3 \text{ mol } H_2SO_4 \times \frac{2 \text{ mol Al}}{3 \text{ mol } H_2SO_4} = 2 \text{ mol Al}$$

REACTIVO LIMITANTE = 3 mol H_2SO_4

$$20^\circ C = 293K \quad 706 \text{ mm Hg} = 0,929 \text{ atm}$$

$$3 \text{ mol } H_2SO_4 \times \frac{3 \text{ mol } H_2}{3 \text{ mol } H_2SO_4} = 3 \text{ mol } H_2$$

$$V = \frac{nRT}{P} = \frac{3 \cdot 0,082 \cdot 293}{0,929}$$

$$V = \underline{\underline{77,57L}}$$