

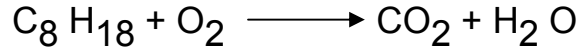
Chemical reactions and the mole concept
التفاعل الكيميائي و المول

وزن المعادلة الكيميائية:

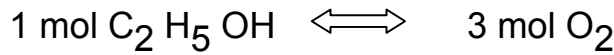
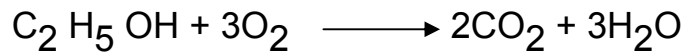
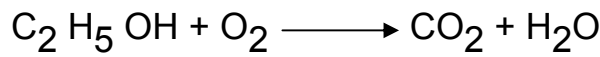
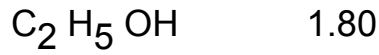
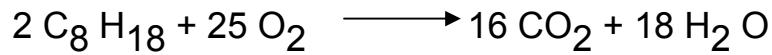
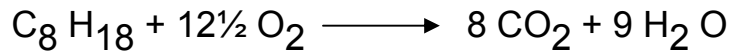
حسب قانون حفظ المادة يجب أن تكون عدد الذرات الداخلة في التفاعل تساوي عدد الذرات الناتجة عنه؟

مثال:

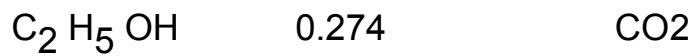
زن المعادلة التالية:

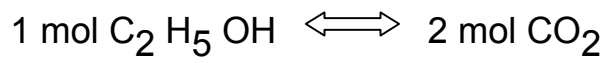


الحل:



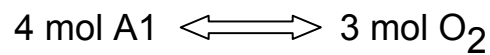
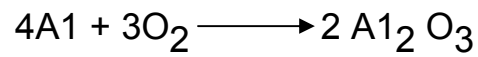
$$1.80 \text{ mol C}_2 \text{H}_5 \text{OH} \times \frac{3 \text{ mol O}_2}{1 \text{ mol C}_2 \text{H}_5 \text{OH}} = 5.40 \text{ mol O}_2$$





$$0.274 \text{ mol C}_2\text{H}_5\text{OH} \times \frac{2 \text{ mol CO}_2}{1 \text{ mol C}_2\text{H}_5\text{OH}} = 0.548 \text{ mol CO}_2$$

0.300



$$0.300 \text{ mol A1} \times \frac{3 \text{ mol O}_2}{4 \text{ mol A1}} = 0.225 \text{ mol O}_2$$

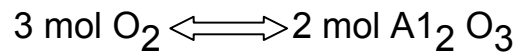
$$1 \text{ mol O}_2 = 32.0 \text{ g O}_2$$

$$0.225 \text{ mol O}_2 \times \frac{32.0 \text{ g O}_2}{1 \text{ mol O}_2} = 7.20 \text{ g O}_2$$

$$0.300 \text{ mol A1} \times \frac{3 \text{ mol O}_2}{4 \text{ mol A1}} \times \frac{32.0 \text{ g O}_2}{1 \text{ mol O}_2} = 7.20 \text{ g O}_2$$

12.5 A₁₂ O₃ ..

:

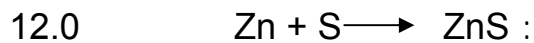


$$1 \text{ mol O}_2 = 32.0 \text{ g O}_2$$

$$1 \text{ mol A}_{12} \text{ O}_3 = 102.0 \text{ G A}_{12} \text{ O}_3$$

$$12.5 \text{ g O}_2 \times \frac{1 \text{ mol O}_2}{32.0 \text{ g O}_2} \times \frac{2 \text{ mol A}_{12} \text{ O}_3}{3 \text{ mol O}_2} \times \frac{102 \text{ g A}_{12} \text{ O}_3}{1 \text{ mol A}_{12} \text{ O}_3} = 26.6 \text{ g A}_{12} \text{ O}_3$$

:

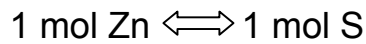


6.50

znS

:

:



$$12.0 \text{ g Zn} \quad \times \quad \frac{1 \text{ mol Zn}}{65.0 \text{ g Zn}} = 0.183 \text{ mol Zn} \quad (\text{Zn})$$

$$6.50 \text{ g S} \quad \times \quad \frac{1 \text{ mol S}}{65.0 \text{ g S}} = 0.202 \text{ mol S} \quad (\text{S})$$

0.019 mol

0.183 mol

0.183

$$\text{g ZnS} = 0.183 \text{ mol Zn} \times \frac{1 \text{ mol Zn S}}{1 \text{ mol Zn}} \times \frac{97.5 \text{ g Zn S}}{1 \text{ mol Zn S}} = 17.8 \text{ g Zn S}$$

:

$$0.019 \text{ mol S} \quad \times \quad \frac{32.1 \text{ g S}}{1 \text{ mol S}} = 0.61 \text{ g S}$$

molarity (M) :

$$\text{Molarity (M)} = \frac{\# \text{ mols F solute}}{\# \text{ F liters F solution}}$$

$$200 \quad (\text{Na OH}) \quad 2.00$$

(Na OH)

$$2.00\text{g Na OH} \times \frac{1 \text{ mol Na OH}}{40.0\text{g Na OH}} = 0.0500 \text{ mol Na OH}$$

$$\text{Molarity (M)} \times \frac{0.0500 \text{ mol Na OH}}{0.200 \text{ L solution}} = 0.0500 \text{ mol Na OH}$$

$$0.0200 \text{ mol} \quad (0.250\text{M}) \quad \text{Na OH}$$

Na OH

$$1 \text{ L soln} \rightleftharpoons 0.250 \text{ mol Na OH}$$

$$0.0200 \text{ mol Na OH} \times \frac{1 \text{ L soln}}{0.250 \text{ mol Na OH}} = 0.0800 \text{ L soln} = 80.0 \text{ mL soln}$$

$$\text{Na} \quad 0.400 \quad 50.0 \quad \text{Na OH}$$

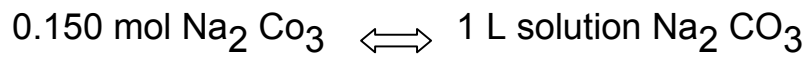
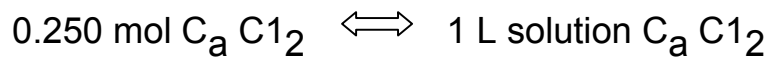
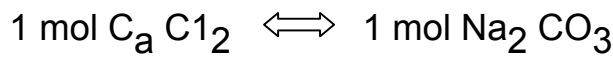
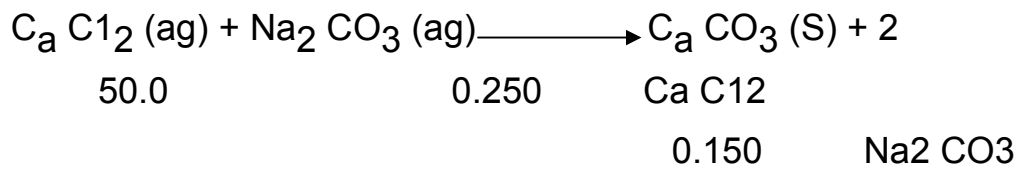
OH

$$0.400 \text{ M Na OH}$$

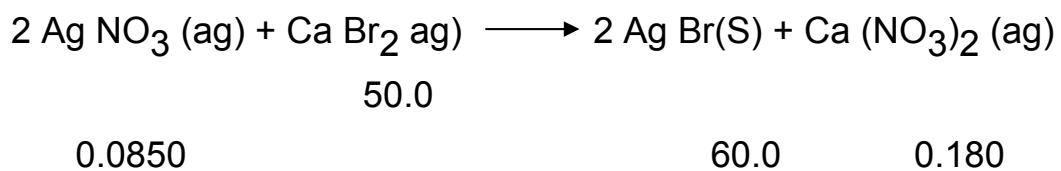
$$1 \text{ L solution} \rightleftharpoons 0.400 \text{ moles Na OH}$$

$$1 \text{ mol Na OH} \rightleftharpoons 40.0 \text{ g Na OH}$$

$$0.050 \text{ L solution} \times \frac{0.400 \text{ mol Na OH}}{1 \text{ L solution}} \times \frac{40.0 \text{ g Na OH}}{1 \text{ mol Na OH}} = 0.800\text{g Na OH}$$



$$\begin{aligned}
 & 50 \text{ ml solution Na}_2 \text{CO}_3 \times \frac{150 \text{ mol Na}_2 \text{CO}_3}{1000 \text{ ml solution Na}_2 \text{CO}_3} \times \frac{1 \text{ mol Ca Cl}_2}{1 \text{ mol Na}_2 \text{CO}_3} \times \frac{1000 \text{ ml solution Na}_2 \text{CO}_3}{0.250 \text{ mol Ca Cl}_2} \\
 & = 30.0 \text{ mol solution Ca Cl}_2
 \end{aligned}$$



$$50.0 \text{ ml Ag NO}_3 \times \frac{0.180 \text{ M Ag NO}_3}{1000 \text{ ml Ag NO}_3} = 9.00 \times 10^{-3} \text{ mol Ag NO}_3$$

$$60.0 \text{ ml Ca Br}_2 \times \frac{0.0850 \text{ M Ca Br}_2}{1000 \text{ ml Ca Br}_2} = 5.10 \times 10^{-3} \text{ mol Ca Br}_2$$

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