Chemical Calculations

Writing and Using Mole Ratios

Mole - Mole Calculations

Example: p. 360 # 12

(a) ? moles O_2 = 14.8 mole Al

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(12) (a)

$4Al + 3O_2 \rightarrow 2Al_2O_3$

$$\frac{? \text{ mole } O_2}{3 \text{ mole } O_2} = \frac{14.8 \text{ mole Al}}{4 \text{ mole Al}}$$

? mole O_2 = 11.1 mole

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(12) (b)

$$\frac{? \text{ mole } Al_2O_3}{2 \text{ mole } Al_2O_3} = \frac{.78 \text{ mole } O_2}{3 \text{ mole } O_2}$$

? mole Al_2O_3 = .52 mole

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Chemical Calculations

Writing and Using Mole Ratios

Mass - Mole Calculations

Example: p. 361 # 14

(14) ? mole CaC_2 = 49 g H_2O

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(14)

$CaC_2 + 2H_2O \rightarrow C_2H_2 + Ca(OH)_2$

$$49 \text{ g } H_2O \left| \frac{1 \text{ mole } H_2O}{18 \text{ g } H_2O} \right| \frac{1 \text{ mole } CaC_2}{2 \text{ mole } H_2O} \Bigg| = 1.36 \text{ mole } CaC_2$$

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Chemical Calculations

Writing and Using Mole Ratios with other Stoichiometric Calculations

Mass - Molecules Calculations

Example: p. 364 # 15

(15) ? molecules O_2 = 6.54 g $KClO_3$

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15

$2\,KClO_3 \rightarrow 2\,KCl + 3\,O_2$

$6.54\,g\,KClO_3 \left| \frac{1 \text{ mole } KClO_3}{122\,g\,KClO_3} \right| \frac{3 \text{ mole } O_2}{2 \text{ mole } KClO_3} \left| \frac{6.02\times10^{23} \text{ molecules } O_2}{1 \text{ mole } O_2} \right|$

4.84×10^{22} molecules

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Chemical Calculations

Writing and Using Mole Ratios with other Stoichiometric Calculations

Volume - Volume Calculations

Example: p. 365 # 17

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$? \text{ L } O_2 = 3.86 \text{ L CO}$

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17

$2CO + O_2 \rightarrow 2CO_2$

$3.86 \text{ L CO} \left| \frac{1 \text{ mole CO}}{22.4 \text{ L CO}} \right| \frac{1 \text{ mole } O_2}{2 \text{ mole CO}} \left| \frac{22.4 \text{ L } O_2}{1 \text{ mole } O_2} \right| = \text{L } O_2$

$1.93 \text{ L } O_2$

Dec 21-7:33 PM

Feb 7-12:15 PM