

1. Calculate the molecular mass for the following:

A. KOH 56.11 g/mol	B. N ₂ O ₂ 60.02 g/mol	C. Cu ₂ SO ₃ 207.17 g/mol	D. Sr ₃ (PO ₄) ₂ 452.80 g/mol
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2. Using FACTOR LABELING, convert each of the following from grams to moles.

A. 15.0 g C ₂ H ₆ $\frac{1 \text{ mol C}_2\text{H}_6}{30.08 \text{ g C}_2\text{H}_6} \times 15.0 \text{ g C}_2\text{H}_6 = 0.499 \text{ mol C}_2\text{H}_6$	C. 140. g NaOH $\frac{1 \text{ mol NaOH}}{40 \text{ g NaOH}} \times 140. \text{ g NaOH} = 3.50 \text{ mol NaOH}$
B. 27.2 g H ₂ O $\frac{1 \text{ mol H}_2\text{O}}{18.02 \text{ g H}_2\text{O}} \times 27.2 \text{ g H}_2\text{O} = 1.51 \text{ mol H}_2\text{O}$	D. 45.7 g CaCO ₃ $\frac{1 \text{ mol CaCO}_3}{100.09 \text{ g CaCO}_3} \times 45.7 \text{ g CaCO}_3 = 0.457 \text{ mol CaCO}_3$

3. Using FACTOR LABELING, convert moles to grams in each of the following:

A. 1.5 mole NH ₃ $\frac{17.04 \text{ g NH}_3}{1 \text{ mol NH}_3} \times 1.5 \text{ mol NH}_3 = 26 \text{ g NH}_3$	B. 0.65 mole H ₂ SO ₄ $\frac{98.09 \text{ g H}_2\text{SO}_4}{1 \text{ mol H}_2\text{SO}_4} \times 0.65 \text{ mol H}_2\text{SO}_4 = 64 \text{ g H}_2\text{SO}_4$
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4. Using FACTOR LABELING, convert the following to moles:

A. 3.01 X 10 ²³ atoms Na $\frac{1 \text{ mol Na}}{6.02 \times 10^{23} \text{ atoms Na}} \times 3.01 \times 10^{23} \text{ atoms Na} = 0.500 \text{ mol Na}$	B. 2.41 X 10 ²⁴ molecules CO ₂ $\frac{1 \text{ mol CO}_2}{6.02 \times 10^{23} \text{ molecules CO}_2} \times 2.41 \times 10^{24} \text{ molecules CO}_2 = 4.00 \text{ mol CO}_2$
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5. Using FACTOR LABELING, convert the following to atoms or molecules:

A. 2.56 mole Ca $\frac{6.02 \times 10^{23} \text{ atoms Ca}}{1 \text{ mol Ca}} \times 2.56 \text{ mol Ca} = 1.54 \times 10^{24} \text{ atoms Ca}$	B. 0.75 mole AlCl ₃ $\frac{6.02 \times 10^{23} \text{ molecules AlCl}_3}{1 \text{ mol AlCl}_3} \times 0.75 \text{ mol AlCl}_3 = 4.5 \times 10^{23} \text{ molecules AlCl}_3$
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6. Using FACTOR LABELING, find the following:

A. the number of grams in 1.25 x 10²⁵ molecules of aluminum oxide. Al₂O₃

$\frac{101.96 \text{ g Al}_2\text{O}_3}{1 \text{ mol Al}_2\text{O}_3} \times \frac{1.25 \times 10^{25} \text{ molecules Al}_2\text{O}_3}{6.02 \times 10^{23} \text{ molecules Al}_2\text{O}_3} = 2120 \text{ g Al}_2\text{O}_3$

B. the number of molecules in 115 g nitrogen dioxide. NO₂

$\frac{6.02 \times 10^{23} \text{ molecules NO}_2}{1 \text{ mol NO}_2} \times \frac{115 \text{ g NO}_2}{46.01 \text{ g NO}_2} = 1.50 \times 10^{24} \text{ molecules NO}_2$

C. the number of atoms of barium in 68.2 g of barium phosphate. Ba₃(PO₄)₂

$\frac{3 \text{ atoms Ba}}{1 \text{ molecule Ba}_3(\text{PO}_4)_2} \times \frac{6.02 \times 10^{23} \text{ molecules Ba}_3(\text{PO}_4)_2}{1 \text{ mol Ba}_3(\text{PO}_4)_2} \times \frac{68.2 \text{ g Ba}_3(\text{PO}_4)_2}{601.93 \text{ g Ba}_3(\text{PO}_4)_2} = 2.05 \times 10^{23} \text{ atoms Ba}$
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