Quiz 6.1: Mole Conversions (Practice)

Key 13-14

- **Don't forget to head your paper.**
- **For credit, place your answers in the boxes or lines provided. If none, be sure to box your answer.**
- **You must show all work, using proper dimensional analysis, should you want credit for your answers.**
- **Don't forget units and to consider significant figures when writing your answer.**

1. What is another name for the quantity 6.02×10^{23}?

Answer
1 mole, 1 mol, or Avagadros number

2. Fill in the empty boxes below with the right names of representative particles & correct molar masses.

Substance	Representative Particle	Molar Mass
Ag	Atom	107.87 g/mol
CO_2	Molecule	44.01 g/mol
Li_2O	Formula Unit	29.88 g/mol

3. Complete the following mole conversions, being sure to show all work as taught in class and including units. For credit, box your answer and consider significant figures.

   a. 2.71×10^{24} Formula Units $Ni(ClO_4)_2$ = __?__ g $Ni(ClO_4)_2$

$$2.71 \times 10^{24}\ \text{f.u.} \times \frac{1\ \text{mol}\ Ni(ClO_4)_2}{6.02 \times 10^{23}\ \text{f.u.}} \times \frac{257.61\ \text{g}}{1\ \text{mol}\ Ni(ClO_4)_2} = \boxed{1160 \text{ -or- } 1.16 \times 10^{3}\ \text{g}\ Ni(ClO_4)_2}$$

   b. 20.0 g C_2H_6 = _?_ C atoms

$$20.0\ \text{g} \times \frac{1\ \text{mol}\ C_2H_6}{30.08\ \text{g}} \times \frac{2\ \text{mol C}}{1\ \text{mol}\ C_2H_6} \times \frac{6.02 \times 10^{23}\ \text{C atoms}}{1\ \text{mol C}} = \boxed{8.01 \times 10^{23}\ \text{C atoms}}$$

   c. 127.0 g Au = _?_ mol Au

$$127.0\ \text{g Au} \times \frac{1\ \text{mol Au}}{196.97\ \text{g Au}} = \boxed{0.6448\ \text{mol Au}}$$

   d. 0.500 mol Mg = _?_ atoms Mg

$$0.500\ \text{mol Mg} \times \frac{6.02 \times 10^{23}\ \text{atoms Mg}}{1\ \text{mol Mg}} = \boxed{3.01 \times 10^{23}\ \text{atoms Mg}}$$