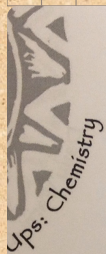


Warm-up:



Pass the Electrolytes, Please

An electrolyte is a substance whose aqueous solution will conduct electricity. In other words, if it is dissolved in water the resulting solution will carry an electric current. This is important to people—we have a mixture of electrolytes in our bodies, and the cells in our bodies use them to regulate the electric charge and flow of water molecules across our cell membranes. This affects our endurance, mental state, strength, and reflexes and the efficiency of our nervous system. This is why many popular sports drinks boast that they replenish the electrolytes that athletes lose when they sweat.

If your nervous system uses electricity to send commands to various parts of the body from the brain, then why is it so important that we maintain a proper level of electrolytes at all times?

Thought Experiment:

Magnesium Metal \rightarrow 24.305g \rightarrow How many atoms are present?

602,000,000,000,000,000,000,000
or

$6.02 \cdot 10^{23}$ \rightarrow Avogadro's #

• Mole: (No, not the furry creature) a unit of measurement representing a collection of particles [Avogadro's #]

\rightarrow Carbon: $12.011 \text{ amu} = \frac{12.011 \text{ g}}{1 \text{ mole}} = \frac{12.011 \text{ g}}{6.02 \cdot 10^{23} \text{ atoms}}$

* Compare to a dozen

1 dozen = 12 items

1 mole = $6.02 \cdot 10^{23}$ items

1. How many dozens are in a barrel of 180 baseballs?

$\rightarrow \frac{180 \text{ baseballs}}{12 \text{ baseballs}} = 15 \text{ dozen}$

2. How many moles of H_2O are there in $3.19 \cdot 10^{24}$ molecules?

$\rightarrow \frac{3.19 \cdot 10^{24} \text{ molecules}}{6.02 \cdot 10^{23} \text{ molecules}} = 5.30 \text{ moles}$

3. How many grams in 1 mole of H_2O ?

$\rightarrow \text{H: } 1.01 \cdot 2 = 2.02$

$\text{O: } 16.0 \cdot 1 = 16.0$

$\frac{18.02 \text{ g}}{1 \text{ mol}}$

4. How many grams in 1 mole of NaCl ?

$\rightarrow \text{Na: } 22.990$

$\rightarrow \text{Cl: } 35.453$

$\frac{58.443 \text{ g/mol}}$

• Molar Mass: # of grams in one mole of any compound

\rightarrow atomic mass, gram formula mass, gram molecular mass.

\rightarrow Ionic

\rightarrow covalent