

Moles

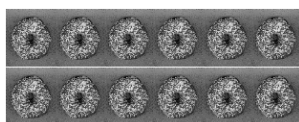
Part II

Quantities

- 1 Dozen = 12
- 1 Baker's Dozen = 13
- 1 Mole = 602,000,000,000,000,000,000,000
 6.02×10^{23}

Quantities (Dozen)

- 1 Dozen Donuts



Quantities (Dozen)

- 1 Dozen Hydrogen Atoms



Quantities (Dozen)

- 1 Dozen Water Molecules



Quantities (Moles)

- 1 mole = 6.02×10^{23}
- 1 mole of cars = 6.02×10^{23} cars
- 1 mole of hydrogen atoms = 6.02×10^{23} atoms
- 1 mole of water molecules = 6.02×10^{23} molecules

Conversions

(6.02×10^{23}) ATOMS \leftrightarrow 1 MOLE \leftrightarrow GRAMS (*Atomic Mass*)

(6.02×10^{23}) MOLECULES \leftrightarrow 1 MOLE \leftrightarrow GRAMS (*Atomic Mass*)

Water Molecules



- If we had one mole of water molecules....
- How many moles of Oxygen Atoms would we have?
1 mole
- How many moles of Hydrogen Atoms would we have?
2 moles

Molar Mass - Water



- Calculate the "mass" of one mole of water molecules.
- Formula: H_2O
- 1 Mole Oxygen = 16.00 g/mol
- 2 Moles Hydrogen = $(1.01) \times 2 = 2.02$ g/mol
- Total "Mass" = 18.02 g/mol

Molar Mass

- The mass (in grams) of 1 mole of a substance (Sum of Atomic Masses)
