Significant Figures

Rules for Counting Sig. Fig.



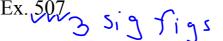
1. Allnon-zero digits are significant

2. Zeroes



2. Zeroes

a) zeroes between non-zero digits are significant





c) Trailing zeroes to the right of a number are significan**if** the number has a decimal point If the number ends in zero and has no decimal point, we assume that the trailing zeroes are not significant.

Ex. 480.0 (4 sig figs)

Ex. 4800 (2 sig figs)

How many significant figures in the following?

a) 38.4703 mL - __6_ sig. figs

b) 0.0052 g - _2_ sig. figs c) 0.05700 s - _4_ sig. figs d) 6.19 x 108 years - _3_ sig. figs

Significant Figures and Calculations

1. Multiplication and Division

The result of the operation is reported as having as many significant figures as the measurement with the fewest/significant figures

Ex. (6.221 cm) x (5.2 cm) =
$$\frac{32.3492}{2}$$

2. Addition and Subtraction

The result of the operation is reported to the same number of **decimal places** as that of the term with the least number of **decimal places**

Measuring Matter

All forms of matter are normally measured by count, mass or volume.

Mole (mol) - SI unit for measuring the amount of a substance A mole of any substance contains 6.02 x 10³ representative particles.

6.02 x 10²³ is referred to as Avagadro's number

Representative particles refers to the species present in a substance, usually atoms, molecules or formula units.

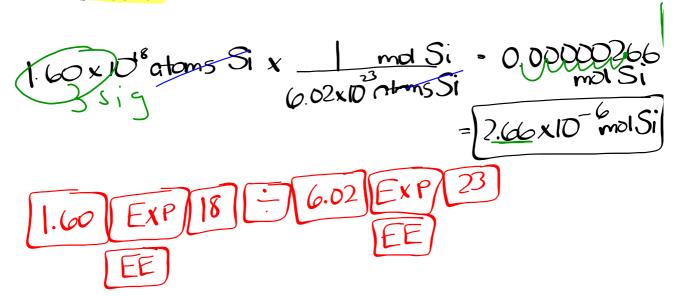
Fe O₂ NaCl

Ex. one mole of atoms = 6.02×10^3 atoms one mole of molecules = 6.02×10^3 molecules

Converting Number of Particles to Moles

1000 X10

Ex. How many moles are found in 1.60 x 10 18 atoms of silicon?



Note*** Exact quantities do not affect the process of rounding numbers to a certain number of significant digits.

Exact Quantity= Conversion factor

Converting Moles to Number of Particles

How many molecules are found in 3.40 mol of Ex.

glucose?

3.40 mgt x 6.02 x10²³ levels = 2.05x10²⁴

1 mgl = 2.05x10²⁴

How many atoms are found in 4.17 mol of Ex. propane (C₃H₈)?

1 mol x 6.02 x 162 moleculs x 1 atoms

1 mol | moleculos 1/8

= 2.761374 x 10 atoms

= 2.76 x 1025 atoms

Note*** Exact quantities do not affect the process of rounding numbers to a cer Exact Quantity= Conversion factor