Scientific Notation



Preliminaries

- Exponential Notation
- Laws of Exponents

Objectives

- Define Scientific Notation
- Work with Significant Digits

Number of inches in a meter ≈ 39.37

Number of molecules in a mole (Avogadro's number) $\approx 602, 214, 076, 000, 000, 000, 000, 000$

Maximum wavelength of visible light \approx 0.000074 millimeters

602, 214, 076, 000, 000, 000, 000, 000.

 6.022×10^{23}

University of Minnesota Scientific Notation

Scientific Notation

Every real number can be expressed as

 $n \times 10^{p}$

where $1 \le n < 10$ and *p* is an integer.

The exponent on 10 is called the **magnitude** of the number.

Avogadro's Number = 6.022×10^{23}

0.000074 millimeters = 7.4×10^{-5} mm

 $26,500,000,000 = 2.65 \times 10^{10}$

 $0.000000174 = 1.74 \times 10^{-8}$

1.74	\times	10 ⁹
+ 2.49	×	10 ⁹
4.23	X	10 ⁹

Addition

$\begin{array}{r} & 1,740,000,000 \\ + & 249,000 \\ \hline & 1,740,249,000 \end{array}$

$1.74 imes 10^9$

Addition

$$1.74 \times 10^9 + 2.49 \times 10^8$$

 $\begin{array}{r} 1,740,000,000\\ + 249,000,000\\ \hline 1,989,000,000\end{array}$

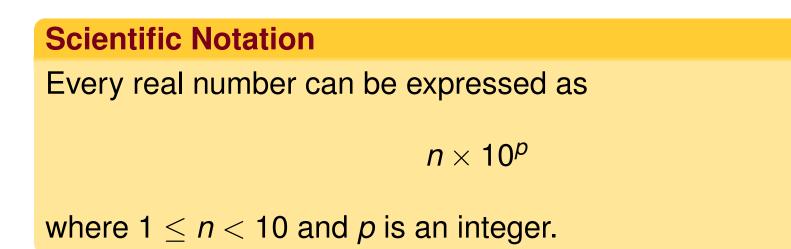
 $1.99 imes 10^9$

$(3.71\times 10^5)(6.4\times 10^{-3})$

$\mathbf{23.744}\times\mathbf{10^2}$

2.3744×10^3

2.4×10^3



- When adding, exclude any digits which are of a place value further to the right than the rightmost significant digit in any of the numbers being added.
- When multiplying, the number of significant digits in the product is the smallest number of significant digits in any factor.