

GENERAL CHEMISTRY STANDARD 1.7

1.7: Convert numbers to and from scientific notation maintaining the precision of the measurement

INTRODUCTION TO SCIENTIFIC NOTATION

- Used to represent very large and very small numbers in a simple way
 - Maintain precision of the measurement
 - Easily count number of significant digits
- Two parts of Scientific Notation
 - Digit term between 1 and 10
 - Exponential term of 10 raised to some integral power
 - Digit and exponential terms multiplied together
- If exponent on exponential term is:
 - Greater than one, number is large (greater than 1)
 - Less than one, number is small (less than 1)
- The precision of the original measurement is maintained by using the same number of significant figures from the original measurement in the digit term of the number in scientific notation.

CONVERTING TO SCIENTIFIC NOTATION

65200

Digit term must be between 1 and 10

Digit Term = 6.52

Exponential term involves how far is decimal point moved in original number to get digit term.

Decimal point moved 4 places to the left

6.52×10^4

0.03402

Digit term must be between 1 and 10

Digit Term = 3.402

Exponential term involves how far is decimal point moved in original number to get digit term.

Decimal point moved 2 places to the right

3.402×10^{-2}

6500

Digit term must be between 1 and 10

Digit Term = 6.5

Exponential term involves how far is decimal point moved in original number to get digit term.

Decimal point moved 3 places to the left

6.5×10^3

CONVERTING FROM SCIENTIFIC NOTATION

$$4.2 \times 10^5$$

Digit Term = 4.2

Exponential term involves how far is decimal point moved in original number to get digit term.

Positive exponent means decimal must move to right five places

420 000

$$8.520 \times 10^{-3}$$

Digit Term = 8.520

Exponential term involves how far is decimal point moved in original number to get digit term.

Negative exponent means decimal must move to the left three places

0.008520

$$9.420 \times 10^2$$

Digit Term = 9.420

Exponential term involves how far is decimal point moved in original number to get digit term.

Positive exponent means decimal must move to the right two places

942.0