

Chemistry Lecture #4: Scientific Notation

Convert the following numbers to scientific notation

<u>Regular notation</u>	<u>Scientific notation</u>
25.1	2.51×10^1
135.56	1.3556×10^2
0.52	5.2×10^{-1}
2502	2.502×10^3
0.003050	3.050×10^{-3}

Solve the following problems and express answer in scientific notation.

$$\begin{array}{r} 7.35 \times 10^2 \\ + 2.43 \times 10^2 \\ \hline 9.78 \times 10^2 \end{array} \quad \begin{array}{r} 4.39 \times 10^5 \\ - 2.8 \times 10^4 \\ \hline \end{array} \rightarrow \begin{array}{r} 43.9 \times 10^4 \\ - 2.8 \times 10^4 \\ \hline 41.1 \times 10^4 \text{ or } 4.11 \times 10^5 \end{array}$$

$$(2 \times 10^4)(3 \times 10^5) = (2 \times 3)(10^{4+5}) = 6 \times 10^9$$

$$(6 \times 10^3)(4 \times 10^{-5}) = (6 \times 4)(10^{3+(-5)}) = 24 \times 10^{-2} = 2.4 \times 10^{-1}$$

$$\frac{6 \times 10^8}{3 \times 10^1} = \frac{6}{3} \times 10^{8-1} = 2 \times 10^7$$

$$\frac{4 \times 10^{-5}}{2 \times 10^{-8}} = \frac{4}{2} \times 10^{-5-(-8)} = 2 \times 10^{-5+8} = 2 \times 10^3$$

You'll be using scientific calculators which have scientific notation functions. Here's how to enter scientific notation for various types of calculators.

Some calculators have an "EXP" button and a "+/-" button. To enter something like 3×10^{-8} , press 3, EXP, +/-, 8. "3. - 08" should appear on the screen.

Some calculators have an EE button instead of an EXP button, but it does the same thing.

With other calculators, "EE" is written above another button, so you have to use the button labeled "2nd" to use the "EE" function. Also, some calculators have a "(-)" button instead of a "+/-" button. In addition, the display of scientific notation looks different.

For example, if you want to enter 3×10^{-8} into the TI-84 graphing calculator, you would press 3, 2nd, EE (written above the "," button), (-), 8. The display on the screen would read "3E-8."

Finally, some calculators can convert a value into scientific notation at the push of a button (or a few buttons). For example, the TI-30XA has "SCI" written above the "5" button. If you press 2nd, 5, it will convert a value into scientific notation.

Be sure to get your own calculator and learn how to use the scientific notation functions. Don't put yourself in a position where you have to borrow a friend's calculator during a test. You may not know how to use it, and you'll panic and perform poorly on an exam.