CHEMISTRY SCIENTIFIC NOTATION PRACTICE I

SCIENTIFIC NOTATION or EXPONENTIAL NOTATION

Scientific notation is very closely related to being able to work with significant digits. A pair of rules that might be the following:

1. A number in scientific notation is written as a many digit number, with only one significant digit to the left of the decimal point. This many digit number is multiplied by 10 to some power.

2. The power of 10 is determined by starting with the original number, the number being converted to scientific notation. Count the number of places that the decimal point must be moved in order to have only one significant digit to the left of the decimal point. For each place the decimal point is moved left, the power of 10 is increased by 1. For each place the decimal point is moved right, the power of ten is decreased by 1.

Examples:

1) Express 350,000 in exponential notation

$350{,}000 = 3.5 \times 10^{5}$

2) Express 0.000000587 in exponential notation

$0.000000587 = 5.87 \times 10^{-7}$

3) Write the number 5.82×10^{6} in standard form

$5.82 \times 10^{6} = 5{,}820{,}000$

4) Multiply

$(3.2 \times 10^{4})\ (6.5 \times 10^{2}) = 2.1 \times 10^{7}$

5) Divide

$(2.57 \times 10^{8})/(4.89 \times 10^{-3}) = 5.26 \times 10^{10}$

STUDENT PRACTICE

A. Express each of the following numbers in correct scientific notation:

1) 0.00374
2) 1200
3) 4063.89
4) 175.1×10^{3}
5) 6460.4×10^{7}
6) 0.06627×10^{-25}
7) 9475×10^{-6}
8) 0.00374×10^{7}
9) 0.0000142×10^{1}
10) 17645
11) 212, 000,000
12) 0.00266
13) 843×10^{5}
14) 94.00×10^{6}
15) 0.0004963×10^{-4}
16) 843.214×10^{-3}
17) 0.00212×10^{12}
18). 0.00839×10^{2}
19) 894.13
20) 0.000 000 831 4
21) 49000.6
22) 9204×10^{5}
23) 87012×10^{23}
24) 0.001413×10^{-4}
25) 17645×10^{-15}

B. Perform the operations indicated:

1) $6.2 \times 10^{-4}\text{m} + 5.7 \times 10^{-3}\ \text{m} =$

2) $8.7 \times 10^{8}\ \text{km} - 3.4 \times 10^{7}\ \text{km} =$

3) $[9.21 \times 10^{-5}\ \text{cm}]\ [1.83 \times 10^{8}\ \text{cm}] =$

4) $2.63 \times 10^{-6}\ \text{m} / 4.08 \times 10^{6}\ \text{s} =$