Chem. 103 Scientific Notation

Scientific notation = a number is written as the product of two numbers: a coefficient between 1 and 10 and a power of 10. The exponent of 10 gives the number of times the coefficient must be multiplied by 10 to give the original number. For numbers smaller than 1, the exponent of 10 is negative.

To convert a number to scientific notation:

1. Write the original number.
2. Move the decimal point to a position just to the right of the first *nonzero* digit.
3. Count the number of places the decimal point was moved. This number will be the exponent of 10.
4. If the decimal point was moved to the left, the exponent will be positive; if moved to the right the exponent will be negative.
5. To convert a number in exponential form to long hand: if the exponent is positive, move the decimal point to the right; if the exponent is negative, move the decimal point to the left.
6. When numbers in exponential form are added or subtracted, the exponents of 10 must be the same.
7. When multiplying numbers in exponential form, multiply the coefficients and add the exponents of 10.
8. When dividing numbers in exponential form, divide the coefficients and subtract the exponents of 10.

Rules for determining the number of significant figures.

1. Every nonzero digit is significant.
2. Zeros between nonzero digits are significant.
3. Zeros in front of a number are not significant.
4. Zeros after a decimal point following a number are significant.
5. When adding or subtracting measurements, the answer can have no more digits to the right of the decimal point than the measurement with the least number of decimal places.
6. When multiplying or dividing measurements, the measurement with the smallest number of significant figures determines the number of significant figures in the answer.