

SIGNIFICANT FIGURES

1. Determining significant figures.

- a. All digits are significant, except zeroes at the beginning of a number and possibly at the end (See also rules b. and c.).

Examples: 9.12
0.912
0.00912

Each of the above numbers has three (3) significant figures.

- b. Terminal zeroes to the right of a decimal point are significant.

Examples: 9.00
9.10
90.0

Each of the above numbers has three (3) significant figures.

- c. Terminal zeroes in a number without a decimal point may or may not be significant. Clarity is introduced by placing a decimal point.

Examples: 900 one significant figure
900. three significant figures

2. Significant figures and algebraic operations.

- a. Addition and subtraction – the number of decimal places in the answer equals the number of decimal places of the input number with the smallest number of decimal places.

Example: $184.2 \text{ g} + 2.324 \text{ g} = 186.5 \text{ g}$

- b. Multiplication and division – the number of significant figures in the answer equals the number of significant figures of the input number with fewest significant figures.

Example: Let 0.0634 g of substance dissolve in 25.31 g of water. How many grams of substance dissolve in 100 g of water?

Solution: The conversion factor is 0.0634 g of substance/25.31 g of water.

$\text{g of substance} = 100 \text{ g of water} \times 0.0634 \text{ g of substance}/25.31 \text{ g of water} = 0.250 \text{ g of substance}$

The answer should have three significant figures!

- c. Rounding of numbers.

- i. The last retained digit is increased by 1, if the following digit is 5 or greater;
ii. The last retained digit is not changed if the following digit is less than 5;

Examples: 1.215 is rounded to 1.22
1.673 is rounded to 1.67

- iii. When working with calculators: In a sequence of algebraic operations only the final answer is rounded! Do not round the intermediate numbers!