

Chapter 1 and 2: Significant Figures and Scientific Notation

Significant digits, which are also called significant figures, are very important in Chemistry. Each recorded measurement has a certain number of significant digits. Calculations done on these measurements must follow the rules for significant digits.

Rules For Significant Digits

1. Digits from 1-9 are always significant.
2. Zeros between two other significant digits are always significant
3. One or more additional zeros to the right of both the decimal place and another significant digit are significant.
4. Zeros used solely for spacing the decimal point (placeholders) are not significant.

Recognizing significant digits will become much easier over time, as you continue to practice the rules. Below are some examples, which show the number of significant digits in a group of numbers, and an explanation why the digits are significant.

Examples of Significant Figures

EXAMPLES	# OF SIG. DIG.	COMMENT
453 kg	3	All non-zero digits are always significant.
5057 L	4	Zeros between 2 sig. dig. are significant.
5.00	3	Additional zeros to the right of decimal and a sig. dig. are significant.
0.007	1	Placeholders are not sig.

Determine the number of significant figures in each of the following:

- | | |
|------------|---------------------------|
| 1) 400 | 10) 22 000 |
| 2) 200.0 | 11) 5201 |
| 3) 0.0001 | 12) 81 |
| 4) 218 | 13) 4.0×10^3 |
| 5) 320 | 14) 1.67×10^{-8} |
| 6) 0.00530 | 15) 5×10^{12} |
| 7) 22 568 | 16) 7000 |
| 8) 4755.50 | 17) 7040.0 |
| 9) 635.000 | 18) 0.006200 |

Scientific Notation allows us to easily represent VERY LARGE numbers and VERY SMALL numbers.

For Example:

Practice With Scientific Notation

Write out the decimal equivalent (regular form) of the following numbers that are in scientific notation.

Section A:

1) $10^2 =$ _____

4) $10^{-2} =$ _____

2) $10^4 =$ _____

5) $10^{-5} =$ _____

3) $10^7 =$ _____

6) $10^0 =$ _____

Section B:

7) $3 \times 10^2 =$ _____

10) $6.0 \times 10^{-3} =$ _____

8) $7 \times 10^4 =$ _____

11) $900. \times 10^{-2} =$ _____

9) $2.4 \times 10^3 =$ _____

12) $4.0 \times 10^{-6} =$ _____

Section C: Now convert from decimal form into scientific notation.

13) $10 =$ _____

16) $0.1 =$ _____

14) $100 =$ _____

17) $0.0001 =$ _____

15) $100,000,000 =$ _____

18) $1 =$ _____

19) $40.0 =$ _____

22) $0.00510 =$ _____

20) $60,000 =$ _____

23) $0.00340 =$ _____

21) $736.2 =$ _____

24) $0.06457 =$ _____

