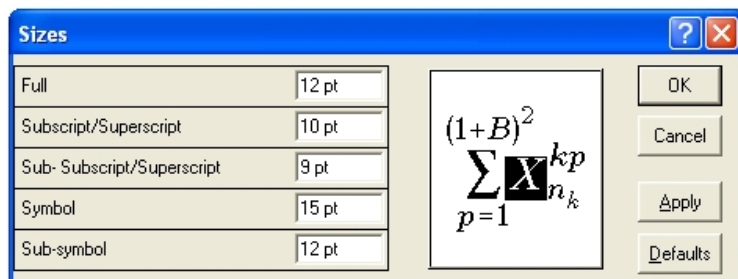
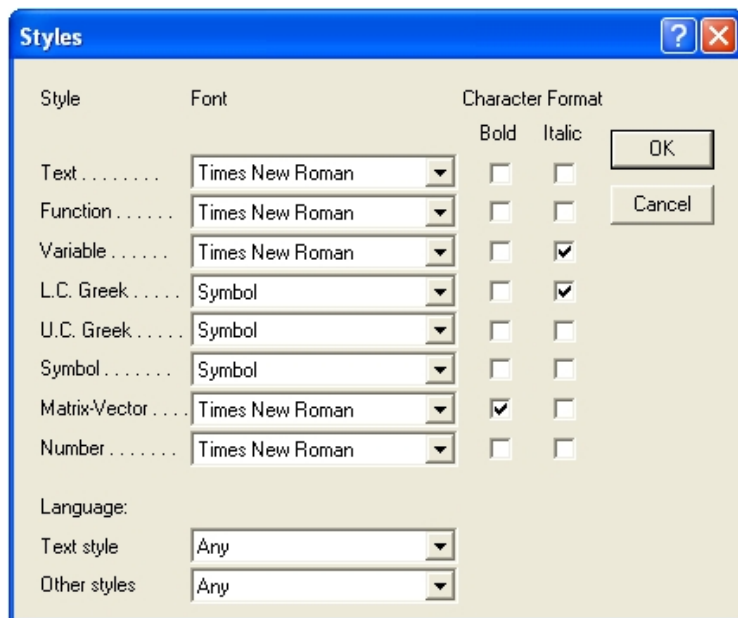


MATHEMATICAL RELATIONS

Use only Microsoft Equation Editor, according to following captures:



RULES AND STYLE CONVENTIONS

⇒ Use normal (upright or roman) fonts for numbers, unit and prefix symbols, descriptive terms, and chemical element symbols—even if the surrounding text is italicized. Use *italic* (slanted) letters for quantity symbols, algebraic variables, constants, and vectors. Press **Ctrl+I** to turn italics on and off. Don't use script (*cursive*) letters for symbols. These rules imply that a subscript or superscript on a quantity symbol is in roman type if it is descriptive (for example, if it is a number or represents the name of a person or a particle); but it is in italic type if it represents a quantity, or is a variable such as x in E_x or an index such as i in $\sum_i x_i$ that represents a number. An index that represents a number is also called a “running number”.

① Quantities and variables → *italic*

Symbols for quantities are italic, as are symbols for functions in general, for example, $f(x)$:

$t = 3 \text{ s}$	t -time, s-second
$T = 22 \text{ K}$	T -temperature, K-kelvin
$r = 11 \text{ cm}$	r -radius, cm-centimeter
$\lambda = 633 \text{ nm}$	λ -wavelength, nm-nanometer

Constants are usually physical quantities and thus their symbols are italic; however, in general, symbols used as subscripts and superscripts are roman if descriptive:

N_A Avogadro constant, A-Avogadro

R molar gas constant

Z atomic number

e elementary charge

m_e m -mass, e-electron

Running numbers and symbols for variables in mathematical equations are italic, as are symbols for parameters such as a and b that may be considered constant in a given context:

$$y = \sum_{i=1}^m x_i z_i \qquad x^2 = ay^2 = bz^2$$

Symbols for vectors are boldface italic, symbols for tensors are sans-serif bold italic, and symbols for matrices are italic:

$$\mathbf{A} \cdot \mathbf{B} = \mathbf{C} \text{ (vectors); } \mathbf{T} \text{ (tensors); } A = \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix} \text{ (matrices)}$$

Symbols used as subscripts and superscripts are italic if they represent quantities or variables:

C_p p -pressure

q_m m -mass

σ_Ω Ω -solid angle

② Units → roman

The symbols for units and SI prefixes are roman:

m-meter

g-gram

L-liter

cm-centimeter

μ g-microgram

mL-milliliter

③ Descriptive terms → roman

Symbols representing purely descriptive terms (for example, the chemical elements) are roman, as are symbols representing mathematical constants that never change (for example, π) and symbols representing explicitly defined functions or well defined operators (for example, $\Gamma(x)$ or div):

Mathematical constants, functions, and operators:

e	base of natural logarithms
Σx_i	Σ -sum of
$\exp x$	exp-exponential of
$\log_a x$	\log_a -logarithm to the base a of
dx/dt	d-1st derivative of

Symbols used as subscripts and superscripts are roman if descriptive:

E_k	k-kinetic	μ_B	B-Bohr
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⇒ In graphs and tables, a slash should be used to separate the designation of physical quantity from the unit (example: p/kPa , $t/^\circ\text{C}$, T/K ...). Designations such as: p (kPa), t [min]..., are not recommended. However, if full name of physical quantity is unavoidable, it should be given in upright letters and separated from the unit by a comma (example: **Pressure, kPa**, **Temperature, K**...).

⇒ Do not use the axis of the graphs for additional explanations; these should be mentioned in the captions and/or the manuscript (example: “**pressure at the inlet of the system, kPa**” should be avoided). The axis name should follow the direction of the axis (the name of y-axis should be rotated by 90°). Top and right axes should be avoided in diagrams, unless they are necessary.

⇒ Latin words, as well as the names of species, should be in *italic*, as for example: *i.e.*, *e.g.*, *in vivo*, *ibid.*, *etc.* The branching of organic compound should also be indicated in *italic*, for example, *n-butanol*, *tert-butanol* *etc.*

⇒ Decimal numbers must have decimal points and not commas in the text, tables and axis labels in graphical presentations of the results. For numbers less than one, a zero is written before the decimal marker. For example, **0.25 s** is the correct form, **not .25 s**. When writing long numbers, use spaces (not commas) to separate digits into groups of three, counting from the decimal point towards the left and right. The space is usually omitted if there are only four digits left or right. To prevent the space from breaking and wrapping to the next line, use a **non-breaking “hard space”** (press **Ctrl+Shift+Space**).

Examples:

76 483 522	<i>but not:</i> 76,483,522
43 279.168 29	<i>but not:</i> 43,279.168 29
8012 or 8 012	<i>but not:</i> 8,012
0.491 722 3	<i>is highly preferred to:</i> 0.4917223
0.5947 or 0.594 7	<i>but not:</i> 0.59 47
8012.5947 or 8 012.594 7	<i>but not:</i> 8 012.5947 or 8012.594 7

FIGURES

Each figure should have a brief caption describing it and, if necessary, a key to interpret the various lines and symbols on the figure. Aim to keep the lettering on figures to a minimum and include as much detail as necessary in the captions.

Figure captions/numbering

Captions should be placed below (or next to) the figure and should finish with a full stop (period).

Figures should be numbered sequentially—“Figure 1”, “Figure 2”, and should be cited in the text as “figure 1”, “figure 2”.

Positioning figures

Individual figures should normally be centred. It is also more convenient for referees of your article if figures are placed as close as possible, and ideally after, the point where they are first mentioned in the text. If necessary, figures and their captions can be grouped together at the end of the article.

Figures in parts

If a figure has parts these should be clearly labelled as (a), (b), (c) etc on the figure. Parts should not have separate captions, but the caption should describe the different parts.

TABLES

Positioning tables

Tables should be centred unless they occupy the full width of the page.

Table captions/numbering

Captions should be placed at the top of the table and should finish with a full stop (period). Narrow captions should be centred, longer captions simply typed as a paragraph. Tables should be numbered sequentially—"Table 1", "Table 2", and should be cited in the text as "table 1", "table 2".

Notes to tables

If you wish to format a table so that it contains notes (table footnotes) to the entries within the body of the table these notes should be formatted using alphabetic superscripts i.e. a, b, c. Notes should be placed at the bottom of the table; one convenient method is to create an empty row at the bottom of the table to contain them. Merge the cells to give you a single cell the width of the table. Table notes should be 10 point Times Roman. Each note should be on a separate line.

FORMATTING THE VALUE OF A QUANTITY

The numerical value always precedes the unit, and a space is always used to separate the unit from the number. Thus the value of the quantity is the product of the number and the unit, the space being regarded as a multiplication sign (just as a space between units implies multiplication). The only exceptions to this rule are for the unit symbols for degree, minute, and second for plane angle, °, ', and ", respectively, for which no space is left between the numerical value and the unit symbol.

This rule means that the symbol °C for the degree Celsius is preceded by a space when one expresses values of Celsius temperature t .

Even when the value of a quantity is used as an adjective, a space is left between the numerical value and the unit symbol. Only when the name of the unit is spelled out would the ordinary rules of grammar apply, so that in English a hyphen would be used to separate the number from the unit (for example, a 35-millimetre film).

MULTIPLYING OR DIVIDING QUANTITY SYMBOLS, THE VALUES OF QUANTITIES, OR NUMBERS

When multiplying or dividing quantity symbols any of the following methods may be used: ab , $a \cdot b$, $a \times b$, a/b , $\frac{a}{b}$, $a \cdot b^{-1}$.

When multiplying the value of quantities either a multiplication sign, \times , or brackets should be used, not a half-high (centred) dot. When multiplying numbers only the multiplication sign, \times , should be used.

Example:

5×10^{-5} but not $5 \cdot 10^{-5}$

When dividing the values of quantities using a solidus (/), brackets are used to remove ambiguities.

Example:

$(a/b)/c$, not $a/b/c$