

18.2.1 Quantities and units

(Measurable) quantity

Attribute of a phenomenon, body or substance that may be distinguished qualitatively and determined quantitatively.

Base quantity

One of the quantities that, in a system of quantities, are conventionally accepted as functionally independent of one another.

Derived quantity

Quantity defined, in a system of quantities, as a function of base quantities of that system.

Example: in a system having base quantities length, mass and time, velocity is a derived quantity defined as: length divided by time.

Dimension of a quantity

Expression that represents a quantity of a system of quantities as the product of powers of factors that represent the base quantities of the system.

Example: in a system having base quantities length and mass whose dimensions are denoted by l , m respectively, ml^{-3} is the dimension of mass concentration as well as of mass density.

Quantity of dimension of dimensionless quantity

Quantity in the dimensional expression of which all the exponents of the dimensions of the base quantities reduce to zero.

Unit (of measurement)

Particular quantity, defined and adopted by convention, with which other quantities of the same kind are compared in order to express their magnitudes relative to that quantity.

Symbol of a unit (of measurement)

Conventional sign designating a unit of measurement.

Examples:

- a) m is the symbol for metre;
- b) A is the symbol for ampere.

System of units (of measurement)

Set of base units, together with derived units, defined in accordance with given rules, for a given system of quantities.

Example: International System of Units, SI.

International System of Units, SI

The coherent system of units adopted and recommended by the General Conference on Weights and Measures (CGPM).

Note: The SI is based at present on seven base units. See Chapter 1.

Multiple of a unit (of measurement)

Larger unit of measurement that is formed from a given unit according to scaling conventions.

Example: One of the decimal multiples of the metre is the kilometre.

Submultiple of a unit (of measurement)

Smaller unit of measurement that is formed from a given unit according to scaling conventions.

Example: one of the decimal submultiples of the metre is the millimetre.

Value (of a quantity)

Magnitude of a particular quantity generally expressed as a unit of measurement multiplied by a number.

Example: mass of a body: 0,152 kg or 152 g.

True value (of a quantity)

Value consistent with the definition of a given particular quantity.

Notes:

- (1) This is a value that would be obtained by a perfect measurement.
- (2) True values are by nature indeterminate.

Conventional true value (of a quantity)

Value attributed to a particular quantity and accepted, sometimes by convention, as having an uncertainty appropriate for a given purpose.

Note: Should not be confused with *reference value*.

Numerical value (of a quantity)

Quotient of the value of a quantity and the unit used in its expression.

Example: In the example given under the term *value*: 0,152 and 152.

Conventional reference scale - Reference value scale

For particular quantities of a given kind, an ordered set of values, continuous or discrete, defined by convention as a reference for arranging quantities of that kind in order of magnitude.

Example: the pH scale in chemistry.