Taxonomy of quantities

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Abstract

The adjectives “generic”, “subgeneric”, “specific”, and “individual” are proposed to be added to the term “quantity”, depending on the case, in order to diminish the ambiguity of this term and to classify the different types of quantities.

Key words: quantity; nomenclature; terminology; taxonomy; property

The definition of the concept ‘quantity’ given in the International vocabulary of metrology (VIM) (1) is “property of a phenomenon, body, or substance, where the property has a magnitude that can be expressed as a number and a reference”. Surprisingly, this official definition (and the term “quantity”) indistinctly refers to different, but very much related, concepts. These concepts have a different degree of ambiguity regarding the phenomenon, body, or substance to which the quantity under consideration belongs, as explained in the VIM. So, it can be said that anyone of the following concepts is a quantity:

a) amount-of-substance concentration;
b) amount-of-substance concentration of glucose;
c) amount-of-substance concentration of glucose in blood plasma; and
d) amount-of-substance concentration of glucose in blood plasma of a given person at a given time.

In order to diminish this ambiguity, I propose, in each case, to add to the term “quantity” an adjective clarifying the degree of ambiguity regarding the phenomenon, body, or substance (or the system, for brevity) owner of the quantity under consideration. According to this idea, in addition to the concept (and term) ‘quantity’ the following concepts (and terms), inspired in the Linnaean taxonomy, may be used:

a) ‘generic quantity’, to be used when neither a system nor one of its components are mentioned (e.g. amount-of-substance concentration);
b) ‘subgeneric quantity’, to be used when a component is mentioned but the system does not (e.g. glucose amount-of-substance concentration);
c) ‘specific quantity’, to be used when a system and one or more of its components are mentioned, but without spatiotemporal address (e.g. glucose amount-of-substance concentration in blood plasma);
d) ‘individual quantity’, to be used when a system, or a system and one or more of its components, are mentioned and spatiotemporally addressed (e.g. glucose amount-of-substance concentration in blood plasma of a given person at a given time).

As individual properties are defined in time and space, they can really be measured. Contrarily, by their nature, generic, subgeneric, and specific quantities cannot be measured. It should be also highlighted that the term “generic quantity” is a superordinate of the terms “basic quantity”, “de-
According to the classification proposed here, the portfolio of any clinical laboratory contains a list specific quantities, whereas the same clinical laboratory to express its production should take into account the individual quantities measured.

In the last decade another classification of quantities has been published (4). In this publication, the terms proposed probably are useful as systematic ones, but are too complicated and sophisticated (and difficult for translation to other languages) to be used as working terms. The equivalences between these systematic terms and the working terms proposed here are shown in Table 1.

Finally, it should be noted that all the proposals presented in this Editorial are applicable to the taxonomy of properties.

Potential conflict of interest

None declared.

References

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Table 1. Terms proposed here and elsewhere (4) compared.

| This proposal (working term) | Other proposal (4) (systematic term) | Example |
|------------------------------|--------------------------------------|---------|
| generic quantity             | kind-of-quantity                     | mass concentration |
| subgeneric quantity          | none proposed                         | mass concentration of protein |
| specific quantity            | dedicated kind-of-quantity            | mass concentration of protein in spinal fluid |
| individual quantity          | instantiation of a dedicated kind-of-quantity | mass concentration of protein in spinal fluid of the patient X.Y., today at 09:15 |

rived quantity”, etc. used by the BIPM, ISO, and IU-PAC, among others (1-3).