International Union of Pure and Applied Chemistry

Consultative Committee for Units – 24th meeting October 8-9, 2019
Bureau International des Poids et Mesures

IUPAC report to the committee

Since the 23rd meeting of this committee, the major IUPAC activity in reference to the use of units has been related to IUPAC project 2013-048-1-100 ("Mole Project"). This project was initiated to achieve the largest consensus among chemists about a redefinition of the mole and resulted in an IUPAC Technical Report [1]. The project was concluded with a second publication, nemaly the IUPAC Recommendation published in January 2018, in which the following wording for the definition of the mole was chosen [2]:

> The mole, symbol mol, is the SI unit of amount of substance. One mole contains exactly $6.022\,140\,76 \times 10^{23}$ elementary entities. This number is called the Avogadro number.

On November 16, 2018, the 26th General Conference on Weights and Measures adopted the following resolution:

> The mole, symbol mol, is the SI unit of amount of substance. One mole contains exactly $6.022\,140\,76 \times 10^{23}$ elementary entities. This number is the fixed numerical value of the Avogadro constant, N_A, when expressed in the unit mol^{-1} and is called the Avogadro number.

In a letter to the President of this Committee dated November 19, 2017, the President of IUPAC, Prof. Natalia Tarasova, thanked the members of this committee for the consideration given to the work carried out by IUPAC.

Other activities are related to the ongoing discussion about

- the status of angles as being quantities that should carry a dimension. While this topic has been approached by some members of ICTNS, as well as by members of Commission I.1 on Symbols, Terminology and Units of the Physical and Biophysical Chemistry Division (Division I), it will be part of the agenda in the forthcoming meetings of these IUPAC committees;
- revision of the IUPAC Green Book is progressing and the revised SI will be incorporated;
- revision and redesign of the Gold Book (webversion). The redesign is finished. Contents of the Gold Book are currently under revision by the respective Divisions and the process is reviewed by ICTNS (see goldbook.iupac.org);
- I would like to discuss within IUPAC whether or not the atomic mass unit, symbol u, should be introduced (again) into a revised version of Table 8 of the SI Brochure; in the current 9th Edition it is removed and solely replaced by dalton, symbol Da, and u appears in the Note to the table only.

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IUPAC Editor-in-Chief Pure and Applied Chemistry
Chair of the Mole Project
Member of the Green Book Working Party (Comm. I.1)

[1] R. Marquardt, J. Meija, Z. Mester, M. Towns, R. Weir, R. Davis, J. Stohner, *A critical review of the proposed definitions of fundamental chemical quantities and their impact on chemical communities (IUPAC Technical Report)*, Pure and Applied Chemistry **89**, 951 (2017). DOI 10.1515/pac-2016-0808

[2] R. Marquardt, J. Meija, Z. Mester, M. Towns, R. Weir, R. Davis, J. Stohner, *Definition of the mole (IUPAC Recommendation 2017)*, Pure and Applied Chemistry **90**, 175 (2018). DOI 10.1515/pac-2017-0106