

Metrology & Hallmark

<https://gum.biuro.jskinternet.pl/wye/content/archives-of-biuletyn-metrologi/volume-4-5/5422,Review-of-the-current-knowledge-associated-with-the-redefinition-of-the-mass-uni.html>
26.10.2026, 15:31

Review of the current knowledge associated with the redefinition of the mass unit

Authors Rafał L. Ossowski - Central Office of Measures (Główny Urząd Miar)

[Avogadro constant](#) [Planck's constant](#) [redefinition of the SI mass unit](#)

Abstract

The article summarizes the state of knowledge on the planned redefinition of the mass unit. The article describes the main reasons for the decision to redefine, the scientific basis of two leading experiments – determination of Planck's constant using the so-called watt balance and in the IAC (The International Avogadro Coordination) project, based on the Avogadro constant. The current research results and the problems related to their interpretation, which forced the postponement of the planned redefinition, were presented. The further direction of research and related plans for the redefinition of the SI unit of mass were also indicated.

Bibliography

- [1] I. M. Mills, P. J. Mohr, T. J. Quinn, B. N. Taylor, E. R. Williams: Redefinition of the kilogram: a decision whose time has come. *Metrologia*, vol. 42 (2005), p. 71.
- [2] R. Davis: The SI unit of mass. *Metrologia*, vol. 40 (2003), p. 299.
- [3] Consultative Committee for Mass and Related Quantities (CCM): Report of the 12th meeting of the International Committee for Weights and Measures. BIPM 2010.
- [4] Resolutions adopted by the General Conference on Weights and Measures (24th meeting). Paris, 2011.
- [5] CODATA recommended values, Josephson constant K_J . Retrieved 10 January 2012.
- [6] CODATA recommended values, von Klitzing constant R_K . Retrieved 10 January 2012.
- [7] M. Stock: Watt balance experiments for the determination of the Planck constant and the redefinition of the kilogram. *Metrologia*, vol. 50 (2013), p. R1.
- [8] P. J. Mohr, B. N. Taylor, D. B. Newell: CODATA Recommended Values of the Fundamental Physical Constants: 2010. *Reviews of modern physics*, vol. 84 (2012), p.1527.
- [9] H. Bettin: Determination of the Avogadro constant by

counting ^{28}Si atoms. Workshop, Turin, 2013.

[10] R. Davis: The role of the international prototype of the kilogram after redefinition of the International System of Units. Phil. Trans. R. Soc. A, vol. 369 (2011).

[11] Consultative Committee for Mass and Related Quantities (CCM). Working Group on the Realization of the Kilogram (WGR-kg), Mise en pratique, 2013.

[12] P. J. Abbott, Z. J. Kubarych: The New Kilogram Definition and its Implications for High-Precision Mass Tolerance Classes. Journal of Research of the NIST, vol. 118 (2013), p. 353.

ISSN 2300-8806

Year 2014

Volume 1-2

Application generates the quote in the selected format.

[Generate quote from this publication](#)

Generate the quote

Download

[Previous Page](#)