

Resolution proposal submitted to the IUPAP Assembly by Commission C2 (SUNAMCO)

The International Union of Pure and Applied Physics (IUPAP) recognizes the International System of Units (SI) for expressing the quantitative results of measurements in physics. Because of the importance of having SI units that provide the most stable and accurate standards for measurements and values of the fundamental constants, IUPAP endorses the recommendations for redefinitions of the SI units made by the Consultative Committee for Units (CCU) to the General Conference on Weights and Measures (CGPM) at its meeting in November 2007. The recommendations are:

- that the kilogram be redefined by assigning an exact value to the Planck constant h ;
- that the ampere be redefined by assigning an exact value to the elementary unit of charge e ;
- that the kelvin be redefined by assigning an exact value to the Boltzmann constant k ;
- that the mole be redefined to be a certain number of entities, thereby assigning an exact value to the Avogadro constant N_A .

These redefinitions should be implemented when there is satisfactory agreement among the experiments that realize the kilogram from the Planck-constant definition, including consistency among the watt-balance determinations of the Planck constant and the silicon-crystal determinations of the Avogadro constant. The changes should be made as soon as there is a satisfactory consistency among the experiments, should be made simultaneously, and should be based on the latest values of the fundamental constants to provide continuity.