Clarification of the definition of the kelvin, unit of thermodynamic temperature

RECOMMENDATION 2 (CI-2005)

The International Committee for Weights and Measures (CIPM),

considering

• that the kelvin, unit of thermodynamic temperature, is defined as the fraction 1/273.16 of the thermodynamic temperature of the triple point of water,

• that the temperature of the triple point depends on the relative amount of isotopes of hydrogen and oxygen present in the sample of water used,

• that this effect is now one of the major sources of the observed variability between different realizations of the water triple point,

decides

• that the definition of the kelvin refer to water of a specified isotopic composition,

• that this composition be:

0.000 155 76 mole of $^2$H per mole of $^1$H,
0.000 379 9 mole of $^{17}$O per mole of $^{16}$O, and
0.002 005 2 mole of $^{18}$O per mole of $^{16}$O,

which is the composition of the International Atomic Energy Agency reference material Vienna Standard Mean Ocean Water (VSMOW), as recommended by IUPAC in “Atomic Weights of the Elements: Review 2000”.

• that this composition be stated in a note attached to the definition of the kelvin in the SI brochure as follows:

“This definition refers to water having the isotopic composition defined exactly by the following amount-of-substance ratios: 0.000 155 76 mole of $^2$H per mole of $^1$H, 0.000 379 9 mole of $^{17}$O per mole of $^{16}$O and 0.002 005 2 mole of $^{18}$O per mole of $^{16}$O”.

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