

15.2: Appendix B- Physical Constants

The following table lists values from *The Nist Reference on Constants, Units, and Uncertainty* of fundamental physical constants used in thermodynamic calculations. Except for those marked “exact,” they are the 2010 CODATA (Committee on Data for Science and Technology) recommended values. The number in parentheses at the end of a value is the standard deviation uncertainty in the right-most digits of the value.

| Physical quantity | Symbol | Value in SI units |
|---|--------------|---|
| Avogadro constant | N_A | $6.022\,141\,29(27) \times 10^{23} \text{ mol}^{-1}$ |
| elementary charge | e | $1.602\,176\,565(35) \times 10^{-19} \text{ C}$ |
| Faraday constant | F | $9.648\,533\,65(21) \times 10^4 \text{ C mol}^{-1}$ |
| gas constant ^a | R | $8.314\,4621(75) \text{ J K}^{-1} \text{ mol}^{-1}$ |
| magnetic constant ^b | μ_0 | $4\pi \times 10^{-7} \text{ N A}^{-2}$ (exact) |
| electric constant ^c | ϵ_0 | $8.854\,187\,817 \dots \times 10^{-12} \text{ C}^2 \text{ J}^{-1} \text{ m}^{-1}$ (exact) |
| speed of light in vacuum | c_0 | $2.997\,924\,58 \times 10^8 \text{ m s}^{-1}$ (exact) |
| standard acceleration of free fall ^d | g_n | $9.806\,65 \text{ m s}^{-2}$ (exact) |

^aor molar gas constant

^bor permeability of vacuum

^cor permittivity of vacuum

^dor standard acceleration of gravity

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