

Reference materials for phase equilibrium studies. 2. Solid–liquid equilibria (IUPAC Technical Report)

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This article is the second of three projected IUPAC Technical Reports on reference materials for phase equilibrium studies. The goal of this project was to select reference systems with critically evaluated property values for the verification of instruments and techniques used in phase equilibrium studies of mixtures. This report proposes seven systems for solid–liquid equilibrium studies, covering the four most common categories of binary mixtures: aqueous systems with organic solutes, aqueous systems with inorganic solutes, non-aqueous systems, and systems with low solubility. For each system, the available literature sources, accepted data, smoothing equations, and estimated uncertainties are given.

<https://iupac.org/project/2011-037-2-100/>

Methods for the SI-traceable value assignment of the purity of organic compounds (IUPAC Technical Report)

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The “purity” of an organic compound typically refers, in practice, to an assignment of the mass fraction content of the primary organic component present in the material. The “purity” value of an organic primary calibrator material is the ultimate source of metrological traceability of any quantitative measurement of the content of that compound in a given matrix. The primary calibrator may consist of a Certified Reference Material (CRM) whose purity has been assigned by the CRM producer

or a laboratory may choose to value-assign a material to the extent necessary for their intended application by using appropriately valid methods. This report provides an overview of the approach, performance and applicability of the principal methods used to determine organic purity including mass balance, quantitative NMR, thermal methods and direct-assay techniques. A statistical section reviews best practice for combination of data, value assignment as the upper limit values corresponding to 100 % purity are approached and how to report and propagate the standard uncertainty associated with the assigned values.

<https://iupac.org/project/2013-025-2-500/>

Minimum requirements for publishing hydrogen, carbon, nitrogen, oxygen and sulfur stable-isotope delta results (IUPAC Technical Report)

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Stable hydrogen, carbon, nitrogen, oxygen and sulfur (HCNOS) isotope compositions expressed as isotope-delta values are typically reported relative to international standards such as Vienna Standard Mean Ocean Water (VSMOW), Vienna Pee Dee belemnite (VPDB) or Vienna Cañon Diablo Troilite (VCDT). These international standards are chosen by convention and the calibration methods used to realise them in practice undergo occasional changes. To ensure longevity and reusability of published data, a comprehensive description of (1) analytical procedure, (2) traceability, (3) data processing, and (4) uncertainty evaluation is required. Following earlier IUPAC documents on terminology and notations, this paper proposes minimum requirements for publishing HCNOS stable-isotope delta results. Each of the requirements are presented with illustrative examples

<https://iupac.org/project/2020-013-1-200/>