

Reply to the Letter “Textbooks and Kinetic Metastability”

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ABSTRACT: This letter discusses the nomenclature issues raised by John Moore’s recent letter on textbook coverage of the subject of kinetic metastability.

KEYWORDS: First-Year Undergraduate/General, Textbooks/Reference Books, Thermodynamics, Kinetics, Nomenclature/Units/Symbols

My thanks to Dr. Moore for bringing this oversight to my attention.¹ His use of the terms “thermodynamic stability versus kinetic stability”, introduced by Roald Hoffmann in his essay of 1987,² rather than the standard terms “stable versus metastable”, calls attention to yet an additional problem of terminology beyond those associated with use of the terms “spontaneous versus nonspontaneous” that were discussed in my paper. There is no doubt that Dr. Hoffmann’s terminology is very attractive. It unambiguously describes what is going on and why, as well as nicely paralleling the terms “thermodynamic control versus kinetic control” now used by all physical organic chemists. In addition, it is becoming increasingly common, as may be verified by consulting the Internet.

Nevertheless, it is not currently accepted by IUPAC³ and disregards the massive literature in physical chemistry, materials science, and physics based on use of the older unmodified terms “stable versus metastable”. Nor is it true, as implied in Hoffmann’s essay, that this older terminology is now used mostly by physicists rather than chemists. As indicated in a previous historical study, this older terminology was first introduced by the chemist Wilhelm Ostwald in 1897⁴ and all of the literature that I consulted on this subject not only used this older terminology but was written by chemists rather than by physicists. Perhaps the best compromise is to explicitly apply Hoffmann’s modifiers to the older terminology and to talk of “thermodynamic stability versus kinetic metastability”, as was partially anticipated in my paper.

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Notes

The authors declare no competing financial interest.

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