Simples and Compounds: A Proposal

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The term "element" is often employed in place of "elementary substance," not only in everyday speech, but also in scientific literature.[1,2] There are some books where "elements and compounds" occur throughout the text.[3] While almost no one makes the mistake of referring to diamond as an element, many people mistakenly refer to substances such as diatomic oxygen (strictly, dioxygen), crystalline silicon, or electrolytic copper as elements.

Significant misunderstandings can follow. For instance, when references are made to hydrogen—so important to solving energy and pollution problems—much confusion exists among people on the street about the availability of this resource. The confusion largely arises from uncertain and imprecise terminology: On Earth, there is plenty of element hydrogen in the form of water and many other abundant hydrogenated compounds, but the elementary substance hydrogen—molecular hydrogen (strictly, dihydrogen), the one which would be most relevant in that context—is almost completely absent. Like in Coleridge's "Rhyme of the ancient mariner": hydrogen, hydrogen, every where, nor any tiny bubble to burn.

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Even for substances with monatomic molecules, such as the noble gases, it would be preferable to avoid designating them as "elements." The latter term should just mean the whole set of nuclides characterized by the same atomic number, independent of the kind of structure they happen to take part in, and the chemical nature of the atoms they happen to be bonded to, if any.

To mark a clear-cut distinction between elements and elementary substances, we suggest replacing the latter term with "simple substances," a term that, according to Scerri[4] and Laing,[5] was employed, with this meaning, by Mendeleev himself.[6] Therefore, we are not proposing the introduction of a new, but the revival of an old, term with noble origins. Besides avoiding confusion, and in spite of its alchemistic flavor, this term would also form a well-matched couple with "compound substances," so that, by transforming the adjectives into substantives, the rather objectionable "elements and compounds" could be replaced by the more acceptable "simples and compounds."

References

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