

Radiogenic isotope: not just about words

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Do you know an inclusive terminology for the product which remains after an original isotope has undergone radioactive decay? Historically, we used Parent/Daughter in English, Père/Fils (Father/Son) in French, Padre/Hijo (Father/Son) in Spanish... Some people also used Parent/Progeny.

Even if style guides from journals discourage the use of gender-specific language, we still see the use of these anthropomorphic words for radiogenic isotope description in many articles and textbooks and still use them in our class.

This problem was already raised by Martin M. Bursey in 1991 who says that:

“Mass spectrometry is not the only discipline that uses daughter to describe the product of a transformation, and indeed the term has been popular for a long time. With the invention of tandem mass spectrometry the related granddaughter ion has been popular, though the phrase is much older.’ The problem is not a lack of clarity. It is that some mass spectrometrists find it offensive. Whoever continues to use a term after learning that it is offensive is rude. Use product ion.”,

and further questioned by Jeanette Adams in 1992 who wrote:

“Thus, I am surprised that the archaic gender-specific terms “daughter,” “granddaughter,” and “great-granddaughter,” and the anthropomorphic “parent ion” and “progeny fragment ions,” are supported in this compilation. Ions are not members of either the plant or animal kingdoms, and thus they are incapable of either sexual or asexual reproduction. Therefore, they are incapable of being either mothers, fathers, daughters, or sons. They are simply ions, or fragments of ions, or products of ion reactions. They can, however, be related as “first, second, or third generation” because, according to my Webster dictionary, “generation” can describe either persons, animals, or thing.”

Ken-ichi Yoshino (2007; 2009) further advocated for a change, but it was only in 2013 that the International Union of Pure and Applied Chemistry deprecated these terms in favor of the more descriptive "precursor ion" and "product ion" terms (Murray et al., 2013).

This terminology makes a lot of sense to us and we encourage all the Isotope Geology community to now use them. Applied to radioisotope terminology, the "daughter nuclide" would be the "product nuclide" of a "precursor nuclide". A product ion could go on to be a "precursor ion" of a new "product ion."

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