

Woodmorappe's Belittling Distortions of the Lu-Hf Method

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^{176}Lu Lutetium (Lu) and its daughter product ^{176}Hf Hafnium (Hf) occur in very small concentrations in most rocks. Because of the low concentrations of Lu and Hf and the very long half-life of ^{176}Lu (35,900 million years), the accurate use of the Lu-Hf method has been limited until recent technological advances (Dalrymple, 1991, p. 80, 95). The Lu-Hf method is now being effectively used to date certain rocks, especially meteorites (Dalrymple, 1991, p. 96). As with any radiometric method, the ancient dates from the Lu-Hf method utterly refute the claims of young-Earth creationism. Therefore, it's not surprising that Lu-Hf dating is yet another target for the wrath of young-Earth creationists. Nevertheless, the only response that Woodmorappe (1999, p. 68) has for the Lu-Hf method is a brief and inadequate statement, which claims that the method has "severe problems." He then quotes the following brief comment from Scherer et al. (1997, p. 63) to supposedly support his shallow accusations:

The Lu-Hf system is demonstrably sensitive to the mineralogy of magma sources in the mantle and crust.

However, does this statement by Scherer et al. (1997, p. 63) REALLY question the reliability of Lu-Hf dating as Woodmorappe (1999, p. 68) suggests? The answer is no. As with many of Woodmorappe's quotations, when they are taken in context, they actually fail to support his antiquated claims. Specifically, the statements of Scherer et al. (1997, p. 63) hardly indicate that the method is useless and unreliable:

The Lu-Hf system is demonstrably sensitive to the mineralogy of magma sources in the mantle and crust ...[references omitted]. As a result, the Lu-Hf system provides a view of crust-mantle evolution that is unique as compared to more commonly used isotopic systems such as Rb-Sr, Sm-Nd, and U-Pb.

Rather than undermining the reliability of the Lu-Hf method, the sensitivity of the method in identifying and dating magma sources is actually an asset!

Scherer et al. (1997, p. 65) further comment on the usefulness of Lu-Hf dating and states:

Whereas the Lu-Hf system commonly follows the same sense of fractionation as Sm-Nd during differentiation processes (i.e., the daughter element is concentration in the melt relative to the parent element), the degree of Lu/Hf fractionation can be greater than that of Sm/Nd when garnet is a residual phase. This property creates some ADVANTAGES for Lu-Hf over Sm-Nd for dating melt-extraction or crystal-accumulation processes involving garnet. [my emphasis]

Also, on p. 76:

Our data DEMONSTRATE the VALUE of the Lu-Hf system for geochronological studies of the lower crust, particularly for samples that contain little or no zircon. [my emphasis]

Rather than conflicting with other radiometric dating methods or supporting the young-Earth creationist agenda, the Lu-Hf system provides another useful research tool for low-zircon rocks that may be difficult to date with other methods. Once more, Woodmorappe (1999) has distorted the radiometric literature.

References:

Dalrymple, G.B., 1991, The Age of the Earth, Stanford University Press, Stanford, California.

Scherer, E.E., K.L. Cameron, C.M. Johnson, B.L. Beard, K.M. Barovich, and K.D. Collerson, 1997, "Lu-Hf Geochronology Applied to Dating Cenozoic Events Affecting Lower Crustal Xenoliths from Kilbourne Hole, New Mexico," Chem. Geol., v. 142, p. 63-78.

Woodmorappe, J., 1999, The Mythology of Modern Dating Methods, Institute for Creation Research, El Cajon, CA.