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Letter to the Editor

Determination of the strontium isotope ratio by ICP-MS ginseng as a tracer of regional origin

Dear Editor,

I read with interest the paper entitled "Determination of the strontium isotope ratio by ICP-MS ginseng as a tracer of regional origin" by Choi, Lee, Lee, and Han (2008). Strontium isotopes are powerful tools for geological fingerprints in Earth Science related fields (Cassidy & Chauvel, 1989). Choi et al. (2008) extends the existing $^{87}Sr/^{86}Sr$ applications to source identification of ginseng. However, the reported $^{87}Sr/^{86}Sr$ results in some Chinese ginseng are abnormally too low, even lower than the most primitive meteorite initial value of BABI (Basaltic Achondrite Best Initial, 0.69899) (Papanastassiou & Wasserburg, 1969). Due to the heavy masses of Sr isotopes, only limited isotopic fractionation can be occurred at surface environments. This implies that false analytical procedures have resulted in wrong $^{87}Sr/^{86}Sr$ determination using the inductively coupled mass spectrometry (ICP-MS) in Choi et al. (2008). Several important symptoms described in the paper also alarm for further detailed scrutiny of the proposed procedures. Firstly, the large analytical uncertainty associated with the NBS 987 standard is unacceptable, more than an order of magnitude higher than available routine TIMS (Waight, Baker, & Peate, 2002) or on-line MC-ICP-MS techniques (Galler, Limbeck, Uveges, & Prohaska, 2008). Possible reasons to cause poor $^{87}Sr/^{86}Sr$ reproducibility are chemical blank, incomplete separation of isobaric species (i.e. Rb^+, Ca argides and the doubly charged REE) and matrix artifacts during ICP-MS measurement. Careful controlled reagent blank reduction and clean separation of Rb and other matrix ions (i.e. Ca and Na) are essential for high precision Sr isotopic determination. However, electronic grade acids and de-ionized waters were used directly by Choi et al. (2008), as well as the use of large size resin column and excessive amount of strong acids. These conditions prevent the analyzed $^{87}Sr/^{86}Sr$ ratios to be useful for accurate extraction of source information in the ginseng specimens.

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C.-F. You
B.-S. Wang
C.-S. Chung
K.-F. Huang
Earth Dynamic System Research Center,
National Cheng Kung University,
No. 1 University Road, Tainan,
Taiwan
Tel.: +886 06 2757575x65438; fax: +886 06 2740285
E-mail address: cfy20@mail.ncku.edu.tw (C.-F. You)

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