

Report of the ARC committee
for the evaluation of the Task Group Isotopes in Geosciences

by Roland Oberhänsli and Ben Mapani

The objectives of the TGIG is the definition of a set of recommendations regarding the isotopic compositions and the half-lives of radioactive isotopes, mainly, but not exclusively, for elements used by the geological community for geochronology.

The Strategies to do so are to:

Distribute and cross-calibrate standards of isotopic composition.

Hold periodic meetings to update conventional acceptance of reference values

Increase awareness in the chemical and geological communities

The TGIG was approached early in 2018 to provide an ARC report and to reflect on setting up a venue for the ARC interviews. They finally provided a short document referring to the terms of reference for the ARC with is extremely concise and short (attachment 1). Having studied this document and discussed amongst the IUGS ARC responsible representatives. We decided that RO should recontact the chair of the TGIG Igor Villa and to discuss the matter. The outcome of this discussion was: the TGIG is still highly motivated and would like to continue its joint work with UPAC without need of financial support from IUGS. TGIG would be proud to continue its work under the umbrella of IUGS. Villa apologised for the slow progress of work, which lays in the methodologies and the fact that standardising isotopic materials is slow. However the three publications produced by TGIG are of utmost importance to the world geo community.

After this commitment of TGIG, we discussed the need to set up an ARC review committee and to spend time and money in travel and meeting for a subject that seems absolutely obvious in its success. We then decided that the two of us should individually talk to experts asking for their opinion as to continue such a task group. The feedback was mostly positive and thus we propose that IUGS should further keep TGIG as a task group.

Ben Mapani
Councillor

Roland Oberhänsli
Past President

Report of TGIG to IUGS

TOR implementation

Upon initiation of the TGIG in 2008, the following Terms of Reference were defined:

Objectives

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Strategies

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Hold periodic meetings to update conventional acceptance of reference values

Increase awareness in the chemical and geological communities

After 10 years, the objectives are being met with regularity. In detail:

The TGIG has issued three recommendations (2011, 2015, 2016) and is issuing a fourth one.

It holds a meeting approximately once a year.

The awareness of the geological community to the recommendations is very good, as attested by the number of citations.

The work of the Task Group is especially long, as each member is asked to unravel the contrasting publications in the literature, then jointly discuss all issues, and derive an agreed recommendation that is expected both by the chemical and by the geological community to be accurate and to last for at least a generation.

The outlook for the forthcoming work of the Task Group is to address two further nuclides used by the geological community: ^{40}K and ^{176}Lu . The former is very extensively used for geochronology of volcanic rocks and has important implications for chronostratigraphy as well as for metamorphic petrochronology. The latter is used in cosmochronology and in Early Earth geochronology and isotope geochemistry. Both of these nuclides are currently the focus of disagreements and conflicts in the geochronological community.

Publications:

2011 - Holden N.E., Bonardi M.L., DeBièvre P., Renne P.R., Villa I.M. - IUPAC-IUGS common definition and convention on the use of the year as a derived unit of time (IUPAC Recommendations 2011). *Pure and Applied Chemistry* 83, 1159-1162

2015 - Villa I.M., De Bièvre P., Holden N.E., Renne P.R. - IUPAC-IUGS recommendation on the half life of ^{87}Rb . *Geochimica et Cosmochimica Acta*, 164, 382–385.

2016 - Villa I.M., Bonardi M.L., De Bièvre P., Holden N.E., Renne P.R. - IUPAC-IUGS status report on the half-lives of ^{238}U , ^{235}U and ^{234}U . *Geochimica et Cosmochimica Acta*, 172, 387-392.

2018 - Villa I.M., Hibbert B., Holden N.E., Ickert R.B., Possolo A., Renne P.R. - IUPAC-IUGS recommendation on the half-lives of ^{147}Sm and ^{146}Sm . *Geochimica et Cosmochimica Acta*, submitted