$^{226}Ra/^{238}U$ disequilibrium as a weathering index in heavy minerals-enriched beach sand sediments

A. PAPADOPOULOS[1*], A. KORONEOS[1], G. CHRISTOFIDES[1] AND S. STOULOS[2]

[1]Department of Mineralogy, Petrology, Economic Geology, Aristotle University of Thessaloniki, 54124, Thessaloniki, Greece (*correspondence: argpapad@geo.auth.gr, koroneos@geo.auth.gr, christof@geo.auth.gr)

[2]Laboratory of Nuclear Physics, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece, stoulos@auth.gr

Weathering indices can be used to quantify weathering of sediments at various stages of weathering and provide a better understanding of element mobility during weathering. For these reasons, various weathering indices are proposed in literature. 37 samples from Kavala and 30 from Sithonia beach sands, all of them being the weathering products of the local granitic plutons are studied for their secular disequilibrium in ^{238}U-series ($^{226}Ra/^{238}U$ ratios) and the results are compared to those of the weathering indices already in use worldwide. The parental rocks of the beach sand sediments were in radioactive secular equilibrium concerning $^{226}Ra/^{238}U$ [1].

Results of $^{226}Ra/^{238}U$ radioactive disequilibrium are quite similar to those given by Weathering Index of Parker (WIP) and Product of Weathering Index (PWI), especially for the well/very well sorted sands and the heavy minerals-enriched sands of Kavala. Therefore it could be used as a relatively sensitive weathering index in sediments, considering however the mineralogical composition and sediment sorting.

[1] Papadopoulos *et al*. 2013. Radioactive secular equilibrium in $^{238}U$and ^{232}Th series in granitoids from Greece. *Appl Radiat Isotopes* **75**, 95–104