

The Influence of Anthropogenic Inputs on the Evaluation of the Weathering Rate of Rocks by U-isotopes ^{234}U and ^{238}U

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^{234}U is preferentially mobilized to ^{238}U in the course of rock weathering, and $^{234}\text{U}/^{238}\text{U}$ activity ratios reflecting disequilibria values in soils and waters have been used to obtain the weathering rate of rocks, technique that was developed for studying two basins located in a semi-arid zone in northeastern Brazil. In this work, such modeling has been tentatively used at the Corumbataí River basin extending over an area of about $1,581 \text{ km}^2$ in São Paulo State, southeastern Brazil. This area, due to its advanced stage of agricultural and industrial growth, has a great diversity of environmental problems, caused, for instance, by chemicals that are used for several purposes, which can affect the U-modeling because of its dependency, among other parameters, of the fraction of uranium released to the waters.

The rain waters in the studied basin are acid, having NO_3^- contents of up to 8.3 mgL^{-1} and PO_4^{3-} contents of up to 1 mgL^{-1} . The stream waters are generally neutral with NO_3^- contents of up to 14 mgL^{-1} , PO_4^{3-} contents of up to 3 mgL^{-1} , and U concentration increasing with increasing flow, accompanying the increase on the PO_4^{3-} content, in accordance with the expected complexation of uranyl ion under the observed pH values. Therefore, the relationship between dissolved U and discharge is opposite of that already referred to in the literature, being certainly affected by anthropogenic inputs that must be taken into account in order to properly evaluate the weathering rate of the rocks of the Corumbataí River basin.