

The influence of weathering processes on riverine uranium isotopes in small mountainous rivers of Taiwan

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Riverine ($^{234}\text{U}/^{238}\text{U}$) activity ratios have been widely used for studying weathering processes and source mixing in river catchments around the world and can be considered as a potential tool that reflects the extent of physical erosion and mineral dissolution during weathering. The main controls on riverine ($^{234}\text{U}/^{238}\text{U}$) in mountainous rivers, however, are still poorly constrained. This study presents major and trace elements and uranium isotopic data for dissolved phase from mountainous rivers of Taiwan. In general, the highest ($^{234}\text{U}/^{238}\text{U}$) were observed in the up-stream of most of the river catchments, and showed a decreasing trend towards the down-stream, highlighting the important roles of geomorphic regime and physical erosion in modulating the riverine ($^{234}\text{U}/^{238}\text{U}$). Of special interest is that the relationship between ($^{234}\text{U}/^{238}\text{U}$) and net uplift rate are significantly distinct in different river catchments, suggesting that the variation of riverine ($^{234}\text{U}/^{238}\text{U}$) ratio is not solely controlled by physical erosion in Taiwan mountainous rivers. Other potential factors will be further discussed in the presented work.