Riverine lithium isotope systematic during continental weathering from an active orogenic belt, Taiwan

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Riverine lithium (Li) isotope potentially offers a unique perspective for continental weathering processes [1, 2]. Based on the investigations of the world's large rivers [3], Li isotopic composition in dissolved load is mainly depended on the intenisty of silicate weathering and the drained lithologies. This is attributed to the high Li content in silicate minerals relative to carbonates and the preferential uptaken of ^{6}Li by secondary clay minerals [4, 5]. However, little is known about whether and to what extent, the Li isotope ratio in river waters was affected by weathering intensity or drained lithology under different climate conditions.

Taiwan is located in an active orogenic belt and its high physcial erosion and chemical weathering rates are mainly due to the tectonic uplift, active earthquake and high runoff discharge. Here we report the systematic survey of Li and its isotopes in the dissolved load along two major tributaries (Laonong and Cishan rivers) of the Kao-Ping River, Southwestern Taiwan, at both wet and dry seasons. Riverine Li contents at dry and wet seasons range from 0.91 to 18.18 μM with δ^{7}Li of +8.2 to +20.3‰, and 0.62 to 2.45 μM with δ^{7}Li of +13.1 to +18.2‰, respectively. Of special interest is that δ^{7}Li in the Laonong river display higher δ^{7}Li values at warm season. This differs significantly from the previous studies [2, 5], which shows low dissolved δ^{7}Li when weathering is more intense because of high runoff and elvated temperature. Combining with Sr isotope and major element data for the dissolved load, our data suggests that in a high-relief, tectonically active terrain the dissolved δ^{7}Li could be significantly influenced by drained lithologies rather than weathering intensity.

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Composing and analysis of geosciences-social economy GIS of Jiangxi Province

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Based on the massive space and attribute data of the Jiangxi special GIS, as well as powerful GIS spatial analysis function, carried through such as earth science background superimposed multi-element analysis, buffer analysis, cross-list of statistics for the administrative center of the city of Jiangxi Province, population, industrial and total agricultural output value, GDP and per capita GDP, the development of an integrated socio-economic indicators, the geological structure units, stratigraphy, lithology and ground elevation, revealed that the socioeconomic development of Jiangxi Geo-related patterns and their inherent laws.

City and county administrative center in Jiangxi Province is mainly distributed in the Cenozoic sedimentary areas, hilly areas and along the geological tectonic units on both sides of the distribution of geographical boundaries, the main city and county administrative center located in geographical boundaries of tectonic units 10-kilometer buffer zone. Based on the characteristics of the control of tectonic units, in Jiangxi Province, divided into eight major tectonic belt.

The space-time patterns of geoscience background of Jiangxi Province,such as Geological structure units, lithostratigraphic, topography, have different characteristics of the internal differentiation between the South and the North. The geoscience pattern restricted the resources and the environment space allocation, and further profound and lasting impact the socio-economic development of Jiangxi Province.