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Elemental and Magnetic Properties of Bed Sediment of Siang River, a Major River of Brahmaputra Basin

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Abstract : The Siang river originates in Angsi glacier in southern Tibet (there known as the Yarlung Tsangpo). After traveling through Indus-Tsangpo suture zone and deep gorges near Namcha Barwa peak, it takes a south-ward turn and enters India, where it is known as Siang river and becomes a major tributary of the Brahmaputra in Assam plains. In this study, we have analyzed the bed sediment of the Siang river at two locations (one at extreme upstream near the India-China border and one downstream before Siang Brahmaputra confluence). We have also sampled bed sediment at the remote location of Yammeng river, an eastern tributary of Siang. The magnetic hysteresis properties show the combination of paramagnetic and weak ferromagnetic behavior with a multidomain state. Moreover, curie temperature analysis shows titanomagnetite solid solution series, which is causing the weak ferromagnetic signature. Given that the magnetic mineral was in a multidomain state, the presence of Ti, Fe carrying heave mineral, may be inferred. The Chemical index of alteration shows less weathered sediment. However, the Yammeng river sample being close to source shows fresh grains subjected to physical weathering and least chemically alteration. Enriched Ca and K and depleted Na and Mg with respect to upper continental crust concentration also points toward the less intense chemical weathering along with the dominance of calcite weathering.

Keywords : bed sediment, magnetic properties, Siang, weathering
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