

Element differentiation during weathering of Amphibolites and Gneisses under humid and arid climate set up of a tropical region

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The speciation of elements during weathering of Amphibolites and Gneisses had been studied under equivalent climatic and physiographic conditions of Cauvery river catchment area, Southern India. The elements were analyzed using standard methods of step by step sequential extraction, in the samples which represent progressive weathering of the rocks under study. 15 elements were analyzed for their behaviour during weathering process. It was observed that elements chose to exist in different phases which was either defined by their elemental properties or chemical behaviour of the species in which they were transformed during weathering. Out of the seven fractions analyzed, V, Cr, Mn, Fe, Co, Ni, Cu, Zn were mostly associated with crystalline and amorphous Fe oxide fractions along with organic fraction. Na, K, Mg, Ca, Sr and Ba were significantly concentrated in exchangeable and organic fractions. Cu, Zn and Ni were also present in carbonate forms. However, the differences in the behaviour of elements due to difference in host rock or climate was found to be trivial. We note that bioavailability and distribution of elements in different geological settings in the environment is already indicated through their speciation during weathering.