

REMOVAL MECHANISM OF SOLUBLE IONS FROM THE MELTING SNOWPACK IN GANGA HEADWATER REGION, BHAGIRATHI VALLEY, GARHWAL HIMALAYA, UTTAR PRADESH, INDIA

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Abstract

The meltwater fractions leachate from the melting snowpack were collected in field conditions from the Ganga headwater Central Garhwal Himalaya. The EC, pH and concentration of major anions (HCO_3^{-1} , SO_4^{-2} , NO_3^{-3} , PO_4^{-3} , Cl^-) and cations (Na^+ , K^+ , Ca^{+2} , Mg^{+2}) were determined in these meltwater leachate samples. The chemical characteristics of the fractionated leachate have showed that the fractionation mechanism of the bulk of the solute in the seasonal snowcover is removed at faster rates than others. The order of elution rate for anions and cations was $\text{NO}_3^- > \text{SO}_4^{-2} > \text{Cl}^-$ and $\text{Ca}^{+2} > \text{Mg}^{+2} > \text{K}^+ > \text{Na}^+$. Elution rate of SO_4^{-2} , NO_3^- and others were observed very different than that the reported by Johnsen and Tranter (1991). Sodium and chloride are found to have the least rate of elution on snowpack melting. This may be probably due to relatively high concentration of nitrate than sulfate in the Himalayan snowpack and snowpack hydrology.

Keywords: Ganga headwater, Preferential elution, Meltwater chemistry, Melting snowpack.