Abstract Details

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Category: Interdisciplinary Working Groups

Paper ID: 57-IWG-A1721

Title: Cation transport with displacement of seawater to groundwater in developing delta of the Yellow River

Abstract:

The coastal groundwater is contacted with the seawater at the discharge area. Cation of the main component in groundwater is dominant in the groundwater flow system. On the other hand, that of seawater is dominant in the depositing sediment on a seaside area. Displacement process of cation from sea component to groundwater component is not clarified in the depositing area of large delta. So, this research conducted the hydrogeochemical research in the delta area. The Yellow River delta is developing by deposition of sediment. The beach line expanded 15 km to the sea during the 20 years. In addition, The Yellow River had been without water flow during the 10yearsfrom 1985 to 1995. We collected sediment samples at the 7 plots on the line of 15 km from the Yellow River to the beach. And we extracted the soil water and adsorbed content. Adsorbed cation was extracted by NH4+ solution. Cation was composed of Na+ in the seaside area. While cation component was Ca2+ in the riverside area. Na+ content in the observation line increased from the riverside to the seaside. Especially, increasing ratio was large in the range of 5 km from the seaside, as compared with that on the inland. This means the displacement from Na+ to Ca2+ in the inland area. Ca2+ content decreased little from the inland to seaside. The cation adsorption capacity increases normally with the pH. The pH of seawater is higher than that of groundwater. This suggests also ion exchange of Na+ with H+. Using the simple displacement model, we can estimate the displacement time. The displacement time was less than 5 years less in the range of 10 km from seaside area. But we need to estimate the detail time of displacement and transport with considering the cation exchange.

Presentation Mode: Poster

Keywords: Cation, exchange, transport, seawater, groundwater

Status: Pending.

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