

Salinity of pore water in low permeable alluvial sediments in the inner Tokyo Bay

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Geochemical characteristics of pore water in sediments including alluvium reflect not only sedimentary environment but also various processes such as diagenesis, advection and dispersion due to groundwater flow, geochemical interactions with sediments, and diffusion. The changes of geochemical characteristics of pore water have been widely observed not only in “aquifer (e.g. sand and gravel)” but also in “aquitard (e.g. silt and clay)” around the world. In addition, in coastal urban areas, human activities such as reclamation and groundwater development have complicated the geochemical processes. However, the complicated processes in the urban area have not been clarified. Geological Survey of Japan, AIST has carried out all-core boring in the inner Tokyo Bay area (from Tokyo lowland to Chiba city) to grasp lithology, sedimentary environment and geological structure. We also have focused on geochemistry of pore water in the alluvium in this area, to understand processes and mechanisms of solute transport and geochemical reactions. We will present the results of estimation of salinity distribution and the mechanisms of it in the alluvium of this area.

As for core samples that were obtained in Chiba area (Funabashi city and Chiba city), Electric Conductivity (EC) of pore water in low permeable alluvial sediments (silt and clay) was from 65 to over 2,000 mS/m. Over 2,000 mS/m means that EC exceeded the measuring limit of the instrument. These values were higher than that of suspensions of core samples obtained at the Tokyo lowland (67 to 1,000 mS/m; Uchida et al., 2011). Salinity was also considered to be high in the upper part of alluvium. These results suggest that desalination has occurred in the alluvium of Chiba area.

Keywords: Tokyo Bay area, Alluvium, pore water, salinity