

Study on the conductivity of calcareous sand

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There is an important relationship between the moisture content and conductivity of the salt-containing calcareous sand in the process of groundwater desalination on lime-sand island. The trend of groundwater desalination can be expressed by the conductivity of the salt-containing calcareous sand. But the conductivity of pore water is difficult to measure directly, however, it can be measured indirectly through conductivity and saturation testing of the calcareous sand. An open and bared ground on a lime-sand island is selected to start the conductivity and saturation tests, sensors of temperature, conductivity and water pressure are buried underground at height 0.5, 1.0 and 1.5m to monitor the electrical conductivity and volumetric water content of the calcareous sand. In addition, the chloride ion content and the conductivity of the calcareous sand with different graduation and water contents are measured by laboratory tests. Results shows that the conductivity of pore water is basically linear with the conductivity of calcareous sand, also a linear relationship as between the volumetric water content and conductivity of calcareous sand. The groundwater conductivity in the lime-sand island linear-fitting with the chloride ion content is also illustrated by the local monitoring and laboratory tests, thus the changes of the chloride ion concentration can be reflected by the conductivity of the pore water, then the salinity of calcareous sand and the desalination of groundwater in lime-sand island can be easily evaluated.

Keywords: calcareous sand, conductivity, volumetric water content, linear relationship, chloride ion concentration