# Physicochemical properties of thin film water in grain boundaries of earth's interior. - "Hard" water in the earth? -

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Water in the earth play essential roles in the earth's dynamics. Recently, water was found to be maily distributed at narrow grain boundaries in rocks. The garin size and the grain boundary width can therefore control the water content of polycrystalline geomaterials. The thin film water at narrow grain boundaries are found to be "hard" with short hydrogen bond distance close to ice. Artificial thin film water is measured by infrared spectroscopy and the in-situ pressure solution cell is uswed to estimate diffusivity along grain boundaries. The significance of this type of hrad water in material transporty and flow in the earth will be discussed.

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