

Abstract Submitted  
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**Study on the Porosity and Water Retention in Soil Using Phase Diagrams and Soil Mechanics** DAVID JAEHYUN PARK, AMANDA KYUNG, Choice Research Group — Soil mechanics is a study field of soil physics and ge-engineering that describes the arrangement and attachment of soil particles such as clay, silt, and sand. It includes solid mechanics and fluid mechanics but it differs from those study area in the sense that soils consist of a heterogeneous mixture of fluids and particles. The soil particles are grouped into structures known as aggregates. The process of grouping soil particles is initiated through flocculation, which involves the exchangeable ions and affects water retention in the soil. In this case, experimental and direct measurements of unsaturated conductivities are difficult due to many factors involved in this situation. In this paper, since soil structure is a property of soil that relates to the arrangement and attachment of many particles, we showed how the flocculation of the particles to facilitate aggregation occurs. Hydraulic conductivity through different soils was calculated based on water retention data, and also computational simulations and calculations were conducted to find porosities for different soils. Finally, sieve analysis considering the size distribution of gravel and sand particles were performed using computational calculations.

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