

砂質土の土壌水分ヒステリシスがガス・熱輸送係数に及ぼす影響

Effect of Hysteresis in the Soil-Water Retention on Gas and Heat Transport Parameters for Sandy Soils

笹沼 公美¹, 濱本 昌一郎^{1*}, 川本 健¹, 榊 利博², 小松 登志子¹

Sasanuma Kumi¹, Shoichiro Hamamoto^{1*}, Kawamoto Ken¹, Sakaki Toshihiro², Komatsu Toshiko¹

¹ 埼玉大学大学院理工学研究科, ² 国立放射性廃棄物協同機構

¹Saitama University, ²National Cooperative for the Disposal of Radioactive Waste, Switzerland

Gas and heat transport parameters such as soil-gas diffusion coefficient (D_p), air permeability (k_a), and thermal conductivity (k_T) are governing parameters for gas and heat transport behaviors in soils. Degree of water-saturation at different water potentials highly affects these gas and heat transport parameters. In this study, the effects of drying and wetting processes in the capillary water zone (water matric potential ranging from 0 to ? 100 cm H₂O) on the D_p , k_a , and k_T were investigated using different sand size fractions at different particle shapes. Degree of soil compaction (i.e., bulk density) on water retention hysteresis, hereunder gas and heat transport parameters was also investigated. Based on the measured data, threshold air-filled porosities for D_p and k_a , air-filled pore-tortuosity, and effective pore diameter for gas transport under drying and wetting processes, and their relations with particles shape, particle size, and compaction levels were discussed.