

## ガス・熱輸送係数に土壤水分ヒステリシスが及ぼす影響 Effects of soil-water retention hysteresis on gas and heat transport parameters

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Knowledge of soil-gas and heat transport parameters is essential for understanding and simulating behaviors of greenhouse/toxic gases and changes in soil temperature at landfill sites. Degree of water-saturation at different water potentials (i.e., water retention characteristic) highly affects these gas and heat transport parameters. In this study, the effects of water retention hysteresis on the soil-gas diffusion coefficient ( $D_p$ ), air permeability ( $k_a$ ), and thermal conductivity ( $K_T$ ) were investigated. Different sand particle size fractions with different particle shapes were used for measuring gas and heat transport parameters. The soil-water retention hysteresis highly affected the gas transport parameters, showing higher  $D_p$  and  $k_a$  values for the wetting processes than those for drying processes at the same air content. This suggests that the more continuous air-filled pore-networks in the wetting processes enhanced diffusive and advective gas transport. As compared to gas transport parameters, the effect of soil water retention hysteresis on the  $K_T$  was insignificant for all sand materials.

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