

# Thermoelectric Behaviors of Carbon Fiber Reinforced Cements

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Thermoelectric properties of carbon fiber reinforced cement composites (CFRCs) have attracted interest in recent years, due to their fascinating ability for harvesting energy in construction. We have evaluated the thermoelectric properties of CFRCs that are fabricated by incorporating pitch-based carbon fiber with high strength, high modulus of elasticity and excellent thermal conductivity into mortar. A relatively high electrical conductivity of 80 S/cm and Seebeck coefficient of 2.65  $\mu\text{V/K}$  was obtained. We observed a consecutive increase in the electrical conductivity with increasing the added amount of carbon fibers. Seebeck coefficients showed a positive electric behavior which indicates that carbon fiber are p-type semiconductors. In addition, the adding effect of boron doped carbon fibers to mortar was evaluated from the viewpoints of substitutionally introduced boron atoms.