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Understanding the increase of the electric permittivity of cement caused by latex addition

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Abstract

The addition to cement paste of latex (styrene-butadiene, latex/cement mass ratio ≤ 0.30 , where latex refers to the latex dispersion with 48 wt.% latex solid) increases the relative permittivity (2 kHz) from 27 to 43. The permittivity increases abruptly at latex/cement ratio ≤ 0.05 , levels off at ratio 0.2, and increases abruptly at ratio ≥ 0.25 . The increase occurs in spite of the low permittivity of latex solid compared to cement. It is attributed to the interface between cement and latex solid. The permittivity is modeled as the cement, latex solid and latex-cement interface in parallel electrically. Cement is the main contributor, followed by the latex-cement interface.

Keywords: A. Ceramic-matrix composites (CMCs); A. Particle-reinforcement; B. Electrical properties; Permittivity.

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