

C-2-4 Achievement of super-hydrophobicity on the surface of cement-based materials by FAS/nano-silica hybrid agent

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ABSTRACT

The durability of hardened cement-based materials can be effectively enhanced by surface treatment. Organic/inorganic hybrid material can take the both advantages of the two surface treatment agents, ensures the double-protection on the surface of cement-based materials. In this work, a superhydrophobic surface was introduced into the surface of cement-based materials through using hybrid silica nanoparticles modified by Fluoroalkyl silane (FAS). The superhydrophobicity depends on both the surface chemistry and the surface roughness. FAS were used as surface functionalizing agents in order to lower the surface energy, and silica nanoparticles are introduced to increase the roughness of the coatings. Meanwhile, the silica nanoparticles could bond the FAS on cement-based materials as a linking agent. The results show that the FAS/nano-silica hybrid material has a good potential to make the surface of the cement-based materials superhydrophobic, which could effectively elongate the service life of the cementitious materials.