Production of polycarboxylate-ether superplasticizer (PCE) coated sand with modified hardened properties in cement mortar

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In this study, the improvement of fine aggregate properties used in cement mortars is presented. Natural river sand was coated with polycarboxylate-ether (PCE) superplasticizer to produce modified coated sand. The addition of PCE superplasticizer was selected to be 7.5%, 15% and 22.5% by weight of sand. In addition, cement mortar mixes were prepared by replacement of natural sand with polycarboxylate-ether superplasticizer (PCE) coated sand at 10%, 30% and 50% by weight. Effects of the various types of coated sand (CS1, CS2 and CS3) on the properties of hardened cement mortar considering the above mentioned replacement percentages were examined. The results indicated that the PCE coated sand contributed in producing mixes with modified properties. For instance, compressive strength enhancement was observed at testing ages of 7 and 28 days. The PCE superplasticizer acted as a coating layer, which was verified through scanning electron microscopy to indicate the superior engineering properties of cement mortar.