

Compatibility of Copolymer-Based Grinding Aids and Sulfonated Acetone-Formaldehyde Superplasticizer

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Abstract : Compatibility between sulfonated acetone-formaldehyde superplasticizer (SAF) and copolymer-based grinding aids (GA) were studied by fluidity, Zeta potential, setting time of cement pasts, initial slump and slump flow of concrete and compressive strength of concrete. ESEM, MIP, and XRD were used to investigate the changing of microstructure of interior concrete. The results indicated that GA could noticeably enhance the dispersion ability of SAF. It was found that better fluidity and slump-keeping ability of cement paste were obtained in the case of GA. In addition, GA and SAF together had a certain retardation effect on hydration of cement paste. With increasing of the GA dosage, the dispersion ability and retardation effect of admixture increased. The compressive strength of the sample made with SAF and GA after 28 days was higher than that of the control sample made only with SAF. The initial slump and slump flow of concrete increased by 10.0% and 22.9%, respectively, while 0.09 wt.% GA was used. XRD examination indicated that new products were not found in the case of GA. In addition, more dense arrangement of hydrates and lower porosity of the specimen were observed by ESEM and MIP, which contributed to higher compressive strength.

Keywords : copolymer-based grinding aids, superplasticizer, compatibility, microstructure, cement, concrete

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