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INFLUENCE OF VISCOSITY-MODIFYING ADMIXTURES ON THE THIXOTROPIC BEHAVIOUR OF CEMENT PASTES

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Water soluble polymers such as cellulosic ethers or starch ethers are often included in the mix-design of Self Compacting Concretes (SCCs) in order to improve their stability and robustness. The stability, including resistance to liquid-solid separation and sedimentation, may be attributed to the increase of the viscosity of the liquid phase due to the thickening effect of the polymer. The later is then referred to as a Viscosity-Modifying Admixture (VMA). In the present study, we consider the influence of VMAs on the rheological properties of the material at cement scale level. In particular, the change in the thixotropic properties of the cement paste due to the inclusion of VMA is investigated. It is found that addition of VMA significantly enhances rebuild-up kinetics at rest following shearing at high shear-rate. The influence of VMA on the steady state rheological properties is also considered. As already reported in the literature, the yield stress is found to monotonically increase with VMA content, while the consistency presents a minimum indicating the existence of an optimum value of the VMA for which the workability of the cement paste is maximum.