

Influence of small organic molecules on the nucleation and growth of C-S-H, the main hydrate of cement

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Additives for concrete are products added in small quantities (doses less than 5% by weight of cement) before or during mixing. Indeed, they are added either in the fresh state, or in the cured state, in order to improve some of the properties of concrete. They can be accelerators for example, by speeding up the early stages of hydration and shorten the setting time, or retarders, used in order to elongate the time for the placement of the slurry, by inhibiting hydration and delaying the setting. However, why they actually work and how is still an enigma and several developed theories has been used. My current project focus on the effect of some of retarders, involving a hydroxycarboxylic, acids, gluconate, and others small organic molecules, mannitol, sorbitol and galactitol, on the nucleation and growth of the main hydrate of cement, calcium silicate hydrate, also called C_S_H.