



Impact of admixtures on the hydration kinetics of Portland cement

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ABSTRACT

Most concrete produced today includes either chemical additions to the cement, chemical admixtures in the concrete, or both. These chemicals alter a number of properties of cementitious systems, including hydration behavior, and it has been long understood by practitioners that these systems can differ widely in response to such chemicals.

In this paper the impact on hydration of several classes of chemicals is reviewed with an emphasis on the current understanding of interactions with cement chemistry. These include setting retarders, accelerators, and water reducing dispersants. The ability of the chemicals to alter the aluminate–sulfate balance of cementitious systems is discussed with a focus on the impact on silicate hydration. As a key example of this complex interaction, unusual behavior sometimes observed in systems containing high calcium fly ash is highlighted.

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