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Superabsorbent polymers to mitigate plastic drying shrinkage in a cement paste as studied by NMR

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1 **Superabsorbent Polymers to Mitigate Plastic Drying Shrinkage in a Cement Paste as**
2 **Studied by NMR**

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14

15 **Abstract**

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17 At early ages, a problem of plastic shrinkage can arise when a cement paste is subjected to
18 harsh drying conditions during hardening. SuperAbsorbent Polymers (SAPs) are a promising
19 admixture to mitigate shrinkage in cement pastes. By introducing internal curing by means of
20 the stored mixing water in the SAPs, the plastic shrinkage can be partially mitigated, next to
21 the mitigation of autogenous shrinkage during setting of the cement paste. The kinetics of
22 water release by the SAPs towards the cementitious matrix have been studied in detail to
23 understand the mechanism. Nuclear Magnetic Resonance (NMR) is an effective technique to
24 non-destructively monitor the effects induced by the SAPs during this plastic period and

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