Nuclear Spin Relaxation and Water Self-diffusion in Hardening Magnesium Oxychloride Cement

Nikolaus Nestle[a,c], Petrik Galvosas[a], Christian Zimmermann[b], Marwan Dakkouri[b], and Jörg Kärger[a]

[a] Universität Leipzig, Abteilung Grenzflächenphysik, Linnéstraße 5, D-04103 Leipzig
[b] Universität Ulm, Abteilung Elektrochemie, D-89069 Ulm
[c] present adress: Technische Universität München, Institut für Wasserchemie, Marchioninistraße 17, D-81377 München

Reprint requests to Dr. N. N.; Fax: 089 7095 7999, e-mail: nikolaus.nestle@physik.uni-leipzig.de

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In this contribution, we report the results of NMR studies of the behaviour of water in a hydrating Sorel cement paste with a composition close to the stoichiometric optimum. Both the transverse spin-relaxation behaviour and water self-diffusion were studied in two separate experiments performed on samples on the basis of the same formulation. While there is a very strong initial decrease in the transverse relaxation time of the water in the paste, the diffusion coefficient is found to decrease mainly at later times of the hydration process where the decrease of the transverse relaxation time has already strongly slowed down. After about 6 h of the hardening process, the signal intensity available for a pulsed gradient diffusometry experiment is not sufficient any more for reliable measurements of the diffusion coefficients.

Key words: Oxychloride Cement; Diffusion; Magnetic Resonance.