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Effects of polyurethane in cement slurries exposed to high temperatures

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The development of researches aiming the structure sector of the oil industry, more precisely in well cementation, has a fundamental importance for nations that have oil as their main source of profits. The objective of this work was to study the effect of different polymer concentrations (polyurethane-PU) in cement slurries with 14 days of cure and exposed to high temperature, 300 °C. From the analysis of the XRD results, it was observed that the Polyurethane (PU) interfered in the formation process of the xonolite crystallographic phase by tobermorite in the formulations with polymer additives. Although the SEM FEG analyses metallized with gold, it was noticed that the addition of polyurethane in the formulations PU1, PU2 and PU3 in concentrations of 1 gpc, 2 gpc and 3 gpc (gallon per cubic foot of cement), the permeability was significantly reduced, as well as the effects of carbonation. Therefore, the reduction of permeability certainly occurred due to the formation of the polymer film, which allowed the porosity decrease in the specimens added with polyurethane and that this polymer interfered in the formation of the crystal (xonolite), conferring more stability to the cementitious material.

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