

Durability of Oilwell Cement Pastes Aged in H₂S-Containing Fluids

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In the near future, oilfield production with high contents of associated sour gases will increase. Therefore, investigations on technologies to produce such fields are of utmost importance. Because of corrosive gases, special attention must be paid to the selection of well materials. Published data on degradation mechanisms by H₂S environments are more scarce than alteration due to CO₂. This paper addresses the problem of durability of oilwell cementitious materials in hydrogen sulphide environments.

We present the methodology implemented for ageing tests in H₂S-containing fluids, under high pressure and temperature conditions, and results obtained on cement-based materials. Main physico-chemical degradation mechanisms of these materials by H₂S are identified using different techniques (XRD, SEM, porosimetry,...). Under the conditions tested, degradation of cementitious materials can occur with dramatic impairment of macroscopic properties: for instance, water permeability is increased by a factor 100.