

EFFECT OF STEAM INJECTION ON MICROSTRUCTURAL AND MECHANICAL PROPERTIES OF CEMENT AND BLAST FURNACE SLAG

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1. ABSTRACT

The isolation of zones is a critical issue in the cement slurry design for steam injection wells. This paper presents the effect of the steam injection process on mechanical and morphological properties of hardened Portland cement and Blast Furnace Slag. Changes in the dimensional stability, permeability and thermal conductivity are also reported.

Four systems of slurries were investigated: one was conventional Portland cement as a reference and three other systems contained blast furnace slag as the cementitious material each using a different drilling fluid as the base. The phase composition, morphology and microstructure of the formed hydration products are reported. The results of the physicochemical properties were related to the values of compressive strength, dimensional changes, permeability and thermal conductivity of the hardened cement. The results show that blast furnace slag slurries provide more temperature stability and less permeability than Portland cement ones. These facts indicate that the blast furnace slag slurries are more appropriate cementing materials for steam injection wells.