PHYSICAL PROPERTIES WAX BASED MAGNETIC FLUID-MODEL FOR MOLTEN ROCKS

S. Molokac[a], P. Rybar[a], M. Rybarova[a], L. Domoracka[a], D. Domoracky[a], J. Kovac[b], P. Kopcansky[b], M. Timko[b]

[a]Faculty of Mining, Ecology, Process Control and Geotechnology, TU Kosice, Letna 9, 042 00 Kosice, Slovakia

[b]Institute of Experimental Physics, SAS, Watsonova 47, 040 01 Kosice, Slovakia

It was shown that one of main advantages of wax based magnetic fluid is big interactive variation of density and viscosity due to changes of temperature and external magnetic fields. These properties allow using this magnetic fluid in simulation the injection of molten rocks into cracks in the order of temperatures lower than the temperature of molten rocks. The paper presents results of magnetization and viscosity measurements bellow and above molten temperature of wax. The failures of rock mass was replaced by a 3D model made from transparent material with defined geometry and the melt is modeled by a wax based magnetic fluid with viscosity comparable to that of molten rock in temperature range up to 1600 K. The visualization was carried out by thermo vision camera. The experimental results showed that wax based magnetic fluid fulfilled the requirements of interactive media for replacement of molten rock and acts as the suitable model fluid for verifying the results of CFD simulation (Computational Fluid Dynamics) over the experiments in the melt pushed into cracks in the infinite and limited lateral ranges.

9.7 cm

13.4 cm

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Corresponding author :
S. Molokac

Address for correspondence :
Faculty of Mining, Ecology, Process Control and Geotechnology, TU Kosice, Letna 9, 042 00 Kosice, Slovakia

Email address :
molokac@saske.sk