Paper ID: 46151
interactive

IAF MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Interactive Presentations - IAF MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (IP)

Author: Mr. Dawid Zimnik
ZARM, University of Bremen, Germany, dawid.zimnik@zarm.uni-bremen.de

NUMERICAL SIMULATION OF WICKING IN POROUS MEDIA

Abstract

Phase separation and the vapor free delivery of the liquids is a challenge in a compensated gravity environment. Porous materials are used for liquid and vapor phase separation. They enable the transport (wicking) of liquid and provide a barrier against penetrating gas (bubble point). The wicking process is the imbibition of liquid into porous structures due to capillary forces. To predict the liquid behavior inside porous materials, numerical simulations on the macroscopic level can be performed. The macroscopic parameters –porosity, pore radius and permeability- have to be known to perform macroscopic simulations. For this purpose, a real sample was scanned using X-ray and a 3D model was reconstructed from it. CFD simulations were performed on the pore level using a 3D model and an appropriate representative volume element (REV) to determine the macroscopic parameter.