
Contribution ID: **579** Type: **Oral 20 Minutes**

# Numerical simulation of wicking in porous media

*Monday, 14 May 2018 11:36 (15 minutes)*

Phase separation and the vapor free delivery of 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 [1].
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 tomography 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 parameters.

## References

Y. Grebenyuk and M. E. Dreyer. Wicking of liquid nitrogen into superheated porous structures. Cryogenics, 78:27-39, September 2016.

## Acceptance of Terms and Conditions

Click here to agree

**Primary authors:** Mr ZIMNIK, Dawid; Prof. DREYER, Michael

**Presenter:** Mr ZIMNIK, Dawid

**Session Classification:** Parallel 1-F

**Track Classification:** MS 4.14: Wicking of Liquids in Porous Materials