



Universität Stuttgart

Institute of Nuclear Technology
and Energy Systems

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Institute of Nuclear Technology and
Energy Systems

Bachelor or
Master Thesis

Experimental
measurement of
contact angle,
effective radius and
permeability of
potassium in steel
wicks

Objective:

The objective of this work is to build and use three small experimental setups to assess the permeability, porosity and effective pore radius of wick structures for heat pipes.

Background:

In the framework of the project "MISHA - Passive cooling of innovative micro nuclear reactors", this research project is geared towards evaluating the heat transport performance of high-temperature heat pipes. In order to have a proper evaluation of those performances, accurate knowledge of the following quantities is needed: contact angle, effective pore radius and permeability. In fact those quantities are essential to properly evaluate the capillary properties of the heat pipe.

Approach:

- Literature review (contact angle, effective radius, capillarity, molten metals).
- Design of the experimental setups and experiments planning.
- Construction and test of the setups.
- Conducting experiments.
- Analyzing and categorizing the results.
- Written report and oral presentation in the IKE-seminar for students.
- Thesis preparation and presentation

Requirements:

- A strong inclination toward hands-on experimental work.
- Basic knowledge in measurement techniques and in LabView software desirable.
- Basic knowledge of MATLAB or Python is a plus.
- English language skills.

Start: from 01.02.2024 or later

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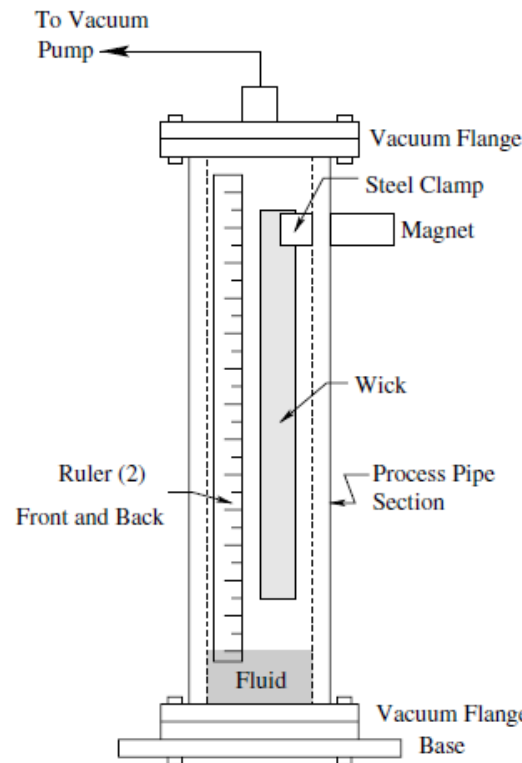


Fig. 1: Example of an experimental setup for rate-of-rise wick property measurement.

(Holley, Faghri 2006)



The University of Stuttgart would like to increase the proportion of women in the scientific field and is therefore particularly interested in applications from women. Severely disabled persons are given priority in the case of equal suitability.



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