Contribution ID: **543** Type: **Oral Presentation**

Incorporating Pore Size Distribution into Dynamic Permeability Modelling for Porous Media

Monday, 13 May 2024 14:10 (15 minutes)

Previous dynamic permeability models often relied on simplified and assumed pore-scale parameters such as average pore radius, potentially leading to inaccuracies. This study introduces a novel approach that directly incorporates measured pore size distributions, addressing these limitations and providing a more realistic representation of fluid flow in porous media. Key findings include:

- Pore size distribution's primary impact on dynamic permeability: The model demonstrates that pore size and its distribution exert a first-order effect on dynamic permeability.
- Integration of measurable pore size data: The model utilizes pore size distributions obtained from techniques like MICP or NMR, enabling direct incorporation of measured data for enhanced model accuracy and applicability.
- Incorporation of slip boundary conditions for wettability effects: The model accounts for wettability's influence on dynamic permeability, providing a more comprehensive understanding of fluid flow behaviour in porous media with varying wettability characteristics.

Overall, this study presents a practical dynamic permeability model that overcomes limitations of existing approaches by incorporating pore size distribution and wettability effects. This model holds significant potential for improved characterization and understanding of fluid flow in diverse porous media applications, potentially leading to advancements in various fields.

Acceptance of the Terms & Conditions

Click here to agree

Student Awards

Country

Australia

Porous Media & Biology Focused Abstracts

References

Conference Proceedings

I am not interested in having my paper published in the proceedings

Primary author: Dr LI, Jimmy Xuekai (The University of Queensland)

Co-authors: Prof. SARMADIVALEH, Mohammad (Curtin University); Prof. REZAEE, Reza (Curtin University); Prof. MÜLLER, Tobias M. (Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE))

Presenter: Dr LI, Jimmy Xuekai (The University of Queensland)

Session Classification: MS21

Track Classification: (MS21) Non-linear effects in flow and transport through porous media