QUANTIFYING THE REACTIVE SURFACE AREA FROM PORE-SCALE SIMULATIONS

Workshop - Knowledge’s frontiers in water unsaturated hydrogeosystems: interface dynamics, heterogeneities & couplings

27-28 JUNE 2019
Orléans

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BRGM / CNRS
What is the accessible reactive surface area?

- Darcy’s scale = averaged equations involving effective properties (permeability, specific surface area...)
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Mineral dissolution at the pore-scale

Developpement of hydro-geochemical *simulation tools* at the pore-scale

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Mineral dissolution at the pore-scale

- Development of hydro-geochemical simulation tools at the pore-scale\(^1\)
- Validation of the numerical model using microfluidic experiments\(^2\)

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Mineral dissolution at the pore-scale

Developpement of hydro-geochemical simulation tools at the pore-scale\textsuperscript{1}

Validation du modèle en comparant avec des expériences microfluidiques\textsuperscript{2}

Interpretation of the results and upscaling\textsuperscript{2}

\textsuperscript{1}C. Soulaine and H. A. Tchelepi, Micro-continuum approach for pore-scale simulation of subsurface processes, Transport in Porous Media (2016)

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\[
\frac{A}{A_0} = 1 - \exp \left( -Pe^{-n} \left( \frac{Da_{II}}{Pe} \right)^{-m} \right)
\]

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How to extend these results to...

...multimineral rocks?

...multiphase flow?
Thank you for your attention

www.cypriensoulaine.com
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