Contribution ID: **33** Type: **Oral Presentation**

Immersion of porous aggregates: application to concrete recycled aggregates

Tuesday, 23 May 2023 10:00 (15 minutes)

Due to the limited resources of alluvial aggregates, the use of recycled aggregates has become a growing practice in the construction industry today. These recycled aggregates come from the recycling of building or road demolition waste. They differ from natural aggregates in their composition and structure. The high porosity of this hardened cement paste implies a high-water absorption, which can reduce the workability and modify the properties of hardened concrete.
This presentation investigates the water transfers between porous aggregates and fresh cement paste. First, sintered glass beads are used as a model porous media; similarly, the cement paste is replaced by water to identify the dominant physical phenomena better.
We thus show the influence of the geometry and microstructure of the porous medium on the imbibition kinetics by immersion in water. Therefore, the commonly used Washburn model must be adapted to describe the imbibition kinetics. Geometry-specific imbibition models are then developed.
In the second step, we characterize the water transfer between the fresh cement paste and the porous aggregates. By Nuclear Magnetic Resonance spectrometry (NMR), we show that the absorption of aggregates in fresh cement paste is lower than in pure water. This decrease in absorption is a consequence of the contraction of the fresh cement paste during imbibition. Furthermore, the absorption kinetics is also slowed down compared to the measurements in water.

Participation

In-Person

References

MDPI Energies Student Poster Award

No, do not submit my presenation for the student posters award.

Country

France

Acceptance of the Terms & Conditions

Click here to agree

Energy Transition Focused Abstracts

Primary authors: KEITA, Emmanuel (Laboratoire Navier); THÉRÉNÉ, Florian; Dr NAËL-REDOLFI, Jennifer (Chryso); Dr BOUSTINGORRY, Pascal (Chryso); Dr ROUSSEL, Nicolas (Université Gustave Eiffel)

Presenter: KEITA, Emmanuel (Laboratoire Navier)

Session Classification: MS21

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