#### InterPore2022



Contribution ID: 257

Type: Oral Presentation

# Novel Pore Scale Visualization during CO2 Injection into CH4 Hydrate Saturated Porous Media

Tuesday, 31 May 2022 17:00 (15 minutes)

CO2 capture in sediments through CO2-rich gas injection into methane gas hydrate reservoir is a recently proposed technology for methane recovery and simultaneously storing CO2 in deposits. CO2 capture and storage in CH4 hydrate formations located at low-temperature, high-pressure conditions, is an attractive proposition as technical and economic costs are lower and it is safer option to store as hydrates, since it offer confined storage, presence of elevated pore pressure, very low CO2 leakage rates and long-term storage potential. The current literature lacks visualization studies that could improve our understanding of fluid migration and hydrate rearrangement during CO2 injection into CH4 hydrate. This experimental study is the first to provide pore-scale visualization (using high-pressure micromodel) when CO2 is injected into CH4 hydrates. Our study shows that the CO2 richness in the invading liquid phase controls the CO2 injectivity and the redistribution of the hydrates. The CO2 content in the liquid phase is controlled by the CO2 injection scheme. The resulting CH4/CO2 mixed hydrates were stepwise depressurized to visualize the hydrate reformation below the CH4 hydrate phase that would improve the recovery of CH4 while reforming the CO2 hydrate, thus keeping the hydrate mass intact. This research would help improve our understanding of an effective CO2 injection scheme for improved CH4 recovery and CO2 storage.

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### References

#### **Time Block Preference**

Time Block C (18:00-21:00 CET)

## Participation

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