

# Compression Behavior of Illite Converted GoM-EI Mudrock

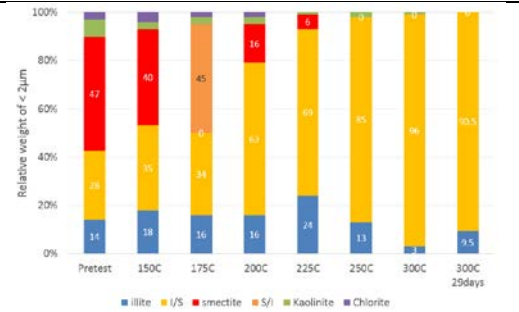
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## ABSTRACT

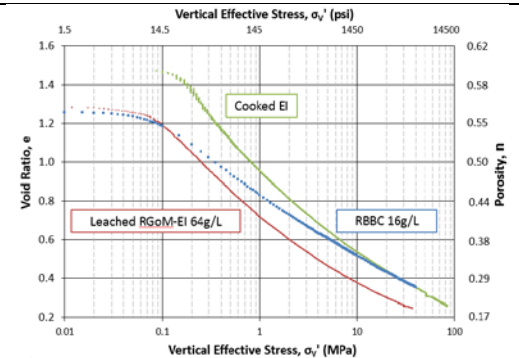
GoM-EI material were cooked at elevated temperature for 18 day (one sample 29 days) in a hydrothermal reactor. The smectite-to-illite transformation reacts with a faster rate as the temperature goes higher. As a general trend, discrete smectite and discrete illite decreases and are represented by I/S phase. Another trend observed in the I/S phase is that the smectite content in the I/S decreases and the illite content in the I/S increases.

This year, we have a bigger volume hydrothermal reactor to produce more converted GoM-EI material. The pretest material was cooked in the bigger volume reactor under 250C for 18 days following the same procedures of small hydrothermal reactor. This temperature and time setting creates high degree of conversion. Then the KCl salt was leached out from the cooked material. The cooked material was resedimented and is going to be tested in CRS device. From CRS test, the compressibility of Cooked GoM-EI (green curve) is greater than the original RGoM-EI (red curve). At higher stress, the Cooked GoM-EI and RBBC converge. The Cooked GoM-EI is more permeable than original GoM-EI but less permeable than BBC.

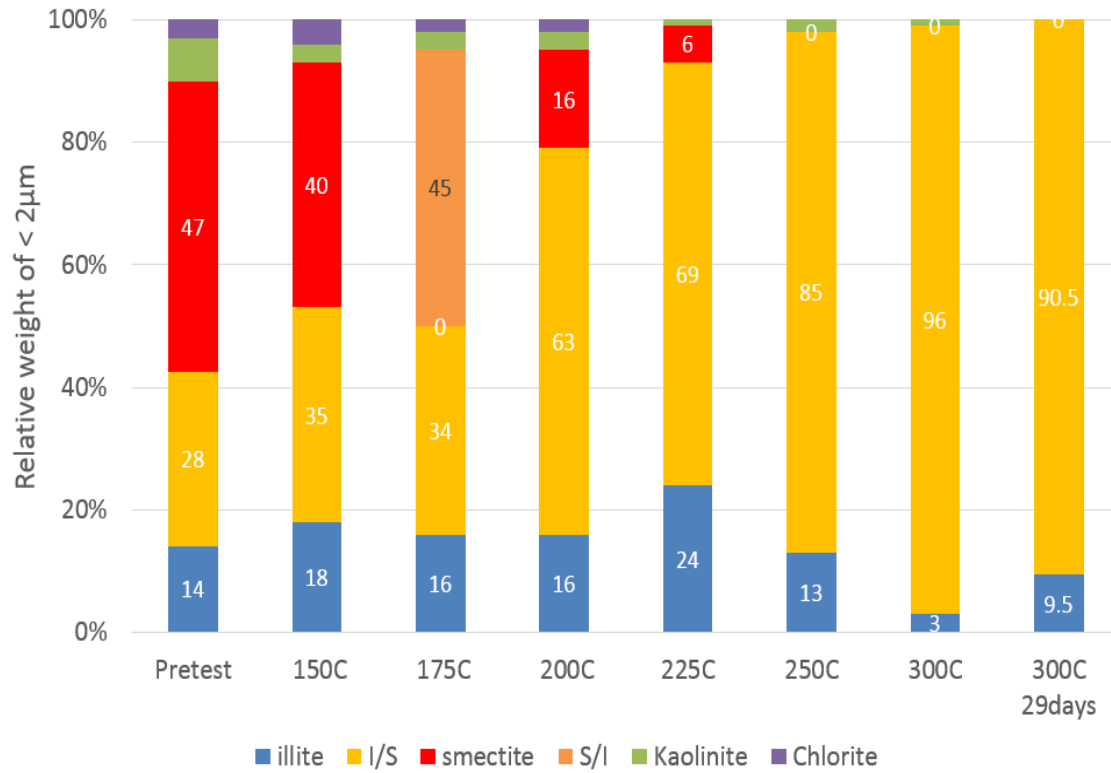
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**Fig 1:** Mineralogy analysis of cooked GoM-EI mudrock (XRD and XRD interpretation was done by Shell). The smectite content decreases at the temperature increases.

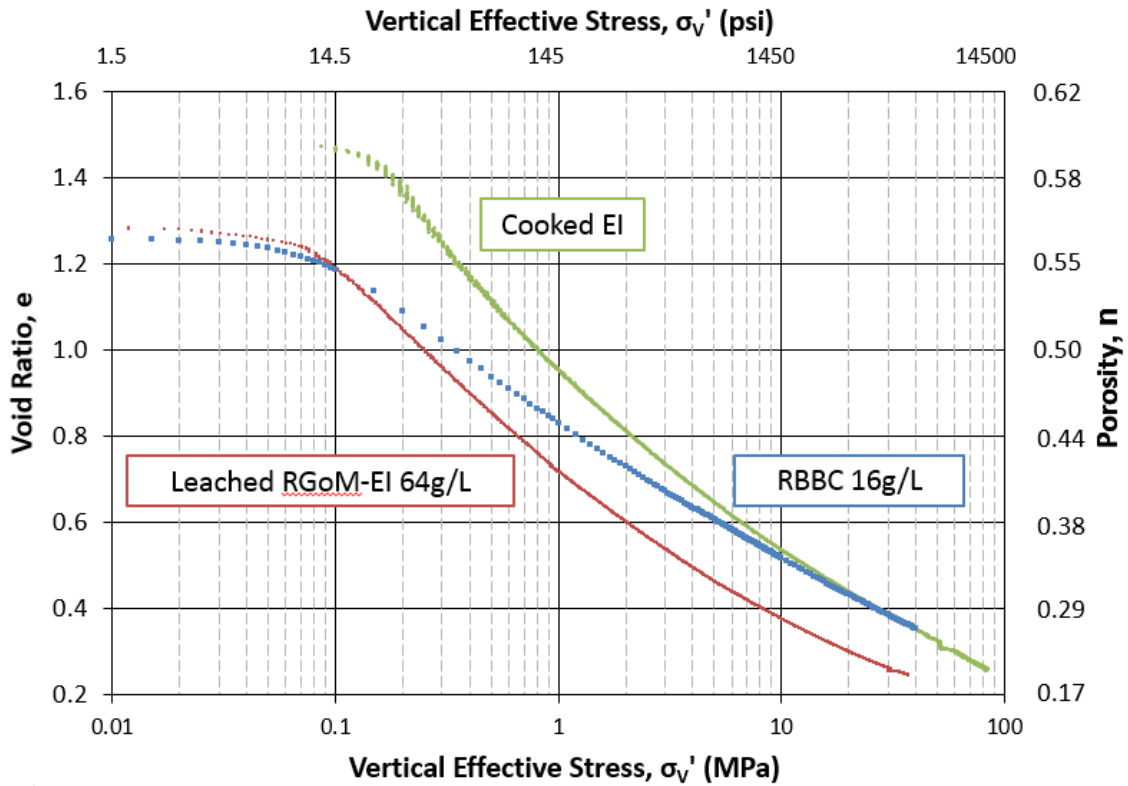


**Fig 2:** The compressibility of Cooked GoM-EI (green curve) is greater than the original RGoM-EI (red curve). At higher stress, the Cooked GoM-EI and RBBC converge.



**Fig. 1:** Minerology analysis of cooked GoM-EI mudrock (XRD and XRD interpretation was done by Shell). The smectite content decreases at the temperature increases.

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**Fig. 2:** The new bigger volume reactor produces 100g of converted GoM-EI material for each cooking. The KCl salt was leached from cooked material. Sea salt was then mixed with leached cooked material. The cooked material was resedimented to 1ksc for CRS testing. From CRS test, the compressibility of Cooked GoM-EI (green curve) is greater than the original RGoM-EI (red curve). At higher stress, the Cooked EI and RBBC converge.

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