



Temperature dependent mechanical behaviour of organic rich shales

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Mechanical behaviour of organic rich shales from the initial stage of loading to final brittle/ductile response has been rarely investigated in the past. It becomes further limited when the effect of temperature on such mechanical response is of interest. This is mainly linked to the limitations in rock sampling, testing facilities and complex mechanisms involved in temperature dependent mechanical behaviour of organic rich shales.

Therefore in this study, a suite of advanced triaxial compressive experiments was performed on organic rich shale samples from Perth Basin, Australia at different temperature (40, 70 and 100 °C). The samples were vacuumed in the vacuum oven to have consistent moisture condition in all samples regardless of temperature.

It was found that the sample ductility significantly increases with temperature. Also, the elasticity and initial yielding were affected by temperature where increase in temperature gives rise to Young's modulus as well as initial yield point. It is noteworthy that such an increase follows an exponential increment.

Keywords: Organic matter rich shales, triaxial experiment, Mechanical behaviour, Temperature dependency