

11.03: Stress and Lithology effects on compression behavior of mudrocks

Mark Zablocki, Tufts University

ABSTRACT

Lithology controls the variation in both permeability and porosity with stress level. The transition between clay-support and grain-support behavior shifts from about 30% to over 50% clay content as stress increases to 100 MPa. Breakage of silt grains decreases the clay content of clay-support grain-support boundary. Permeability decreases gradually with stress in the grain support region but dramatically in the clay supported region. An empirical model is proposed to compute lithology dependent depth profiles of compression, permeability and coefficient of consolidation.

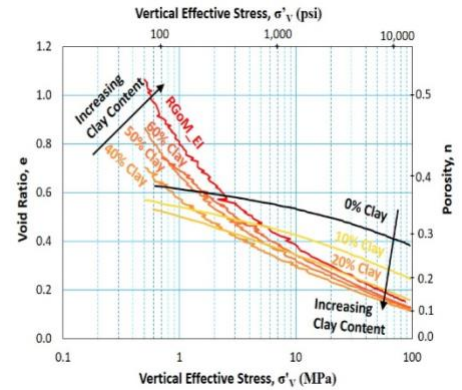


Fig 1: Void ratio vs vertical effective stress compression curves of mudrocks with varying lithology to 100 MPa.

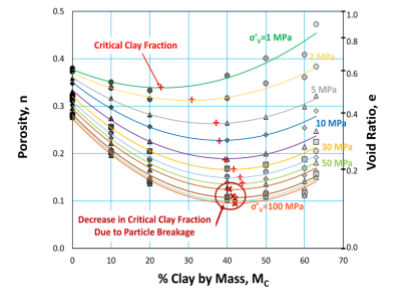


Fig 2: Porosity vs clay content by mass at select stress levels from 1MPa to 100 MPa.

CLICK ON IMAGE FOR LARGER VIEW

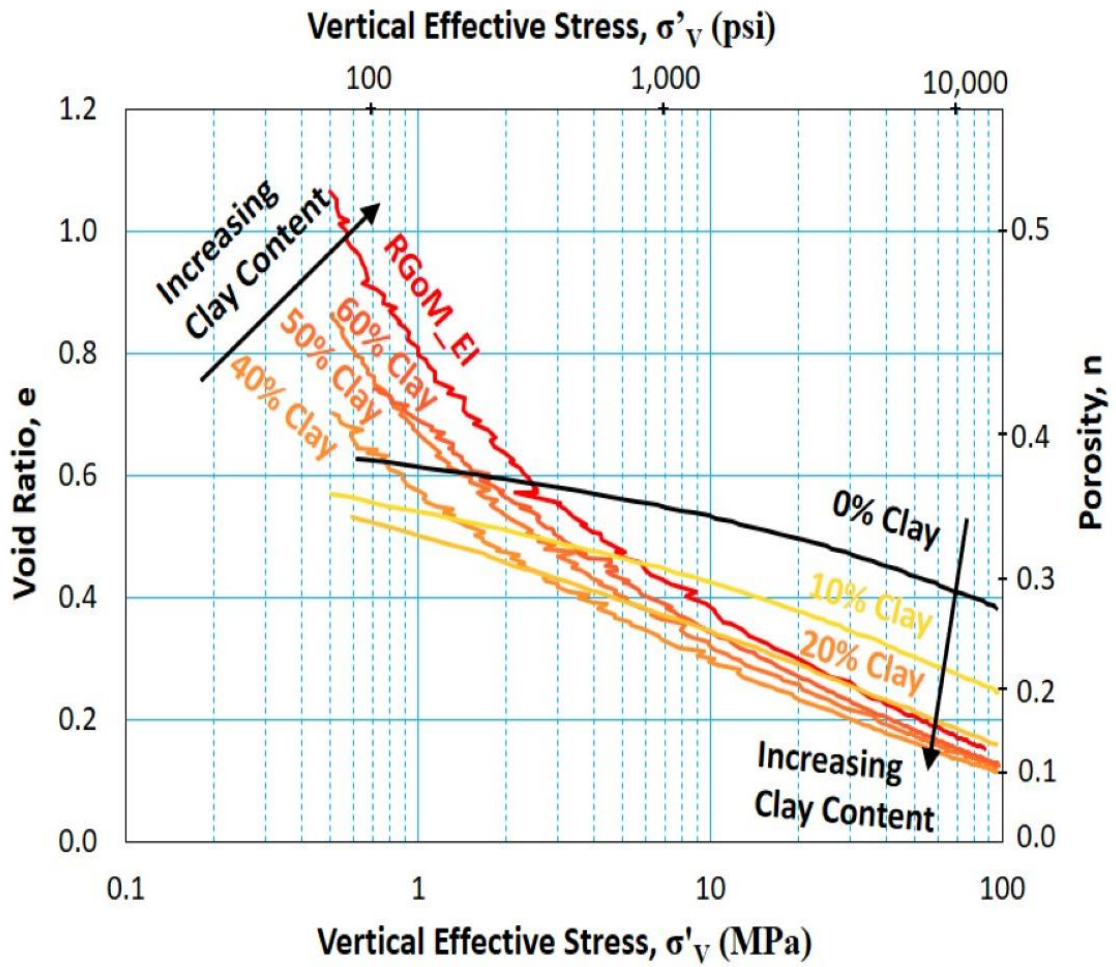


Fig. 1: eLogP compression curves of mudrocks with varying lithology to 100 MPa.

[Back](#)

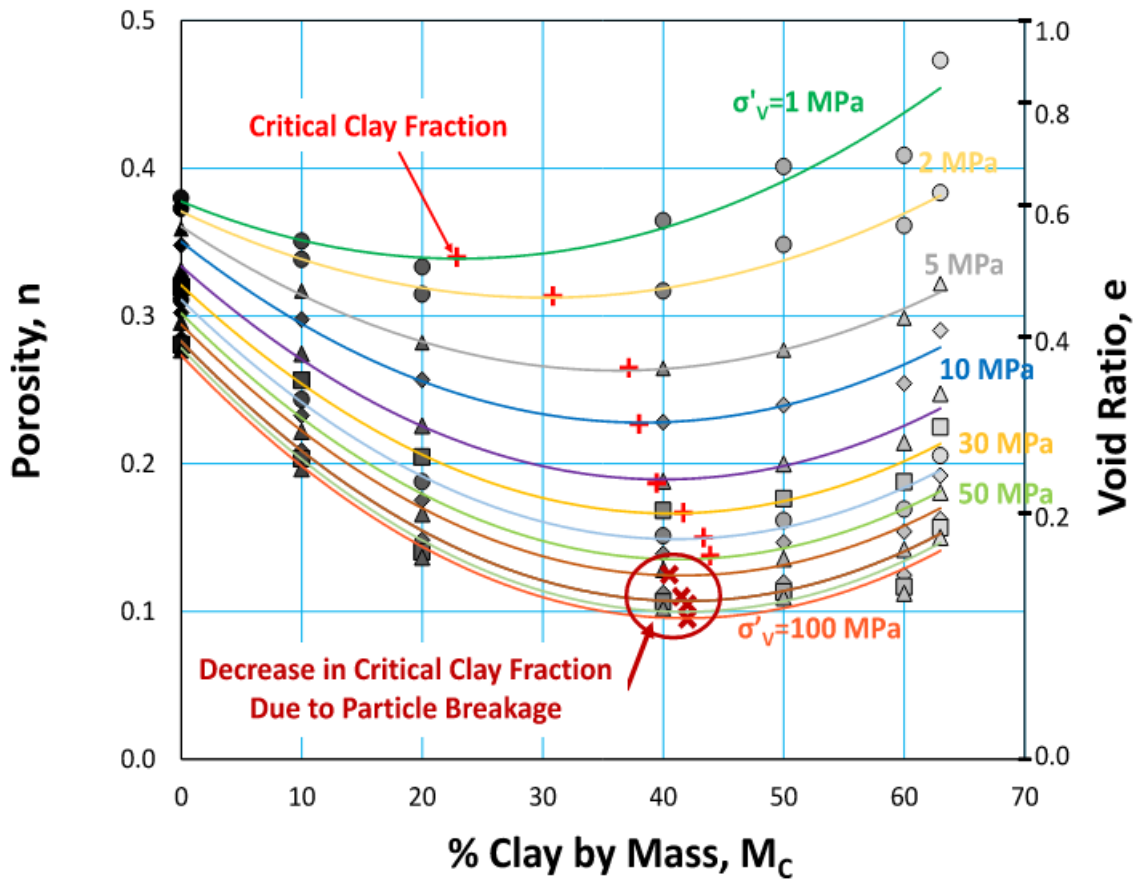


Fig. 2: Porosity vs clay content by mass at select stress levels from 1MPa to 100 MPa.

[Back](#)