



## **Experimental study of the correlation between thermal conductivity and saturation of selected sandstones**

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In the literature, not much information exists about the correlation between thermal conductivity and saturation of sedimentary rocks and sediments. One difficulty is the impact of varying saturation (drying/moistening) on the rock fabric, especially when the sediment contains clay. In this study, we examined the relationship between thermal conductivity and saturation of eight sandstones from different German sites. Their porosities vary from 5 % to 25 % and the quartz content ranges from 75 % to 90 %. We measured thermal conductivity with an optical scanner. After complete saturation of the samples with water, thermal conductivity and the loss of water were recorded in the course of evaporation under laboratory conditions until the samples arrived at equilibrium weight. First results show that the relationship between thermal conductivity and saturation is nonlinear. Comparing several geometric models, the serie-parallel model fits best for high porous sandstones without clay at higher saturation levels. The clay content influences the run of the curve, thus, the serie-parallel model is not applicable when the samples contain clay. Consequently, the measurements will be completed by conducting such experiments on clay samples as well as on low porosity clayless sandstones in order to apply the models for all clastic sediments.