Geophysical Research Abstracts
Vol. 16, EGU2014-9412, 2014
EGU General Assembly 2014

Linking external and internal salt geometries – a key to understanding salt dynamics

Peter Kukla and Janos Urai
RWTH Aachen University, Energy & Mineral Resources Group, Aachen, Germany (peter.kukla@emr.rwth-aachen.de)

Considering the growing importance of salt in the energy, food and waste disposal industries, this paper reviews the status quo and major developments in salt research over the last decade. As a way forward in order to close identified gaps in knowledge, an integrated salt basin evaluation concept is proposed appreciating both external and internal geometries and properties. Examples of key studies in the Central European Basin and the South Oman Salt basin show that such a model may improve our understanding of the multi-scale processes operating in salt terrains.

The workflow proposed allows to better asses (i) the initiation and maintenance of salt dynamics, (ii) the evolution of the internal structure of evaporites during halokinesis in salt giants, (iii) the coupling of processes in the evaporites and the salt's under- and overburden. It will lead to a better integration of the different data sets and resulting models, which will provide new insights into the structural evolution of salt giants. Finally it will also stimulate new concepts for (i) the initiation dynamics of halokinesis, (ii) the rheology and mechanics of the evaporites by brittle and ductile processes, (iii) the coupling of processes in the evaporites and the under- and overburden, and (iv) the impact of the layered evaporite rheology on the structural evolution.

As an outlook for future research to be initiated in salt terrains we still need to improve our database on evaporite rocks especially the ones which take changes of properties in time into account. This includes for example the dependencies of thermal and mechanical properties on changes in strain, pressure and temperature or external and internal geometry changes relating to slow geological processes. Also geomechanical modelling efforts can be significantly improved by making full use of the data available on the effects of water, and some of the discrepancies seen in experimental data on different salts can probably be explained in terms of these effects. This all will contribute to the development of new integrated techniques for investigating and predicting salt structures from multiple data sets.