Tracking the path of ore-related fluids by stable isotope investigations of carbonates at the tectonic base of the Graz Paleozoic (Eastern Alps)

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Ore mineralization within the Graz Paleozoic is related to fluid activity during Lower Creatceous thrusting and subsequent Late Cretaceous extension. A fluid conduit is given by carbonates at the tectonic base of this unit (e.g. the so-called “Grenzmarmor”). To track the origin and migration path of the fluid flow, kinematically well-constrained carbonate occurrences (Birkfeld, Almgraben, Graden, Krenhof, Schöckl, Kugelstein) are investigated by detailed stable isotope investigations.
The delta-values of oxygen and carbon show a significant covariation, which reflect a systematic change in the oxygen and carbon isotopic composition of the carbonates due to fluid alteration. Based on fluid migration models in open systems, the results are used to establish a fluid model along the tectonic base of the Graz Paleozoic which gives evidence for fluid flow related to late-stage ore precipitation within the Graz Paleozoic.

Structural Models for Exploration in the Mesozoic section of the Vienna Basin

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Numerous petroleum companies have been exploring the Vienna Basin for oil and gas since the last 100 years. The exploration in the Vienna Basin is vertically divided in three levels: level 1 with Neogene strata (Miocene sediments), level 2 holding units formed during alpine orogeny (Calcareous Alps and Flysch) and level 3 representing the autochthonous units of the European basement. Level 2 and 3 are summarized as Pre-Neogene. The geological and tectonic setting for each of these three levels is diverse with a different age, style of deformation, and lithology; hence the methodology and strategy of exploration is adapted to each level.
For level 1, the Miocene strata, 3D seismic interpretation, seismic attributes and sequence stratigraphy are standard tools for exploration. In contrast, for the Pre- Neogene (level 2 & 3) geological and structural modelling are much more important and seismic interpretation is applicable only in selected areas for structural mapping only due to medium or poor quality of seismic data.
To successfully explore the Pre-Neogene accurate structural models are required. This structural understanding is based on the full integration of regional geological studies, geophysical data, petrophysical data and laboratory data.
In close cooperation with the OMV laboratory and the University of Vienna field surveys and outcrop studies are planned for a better understanding of the highly complex structures in the Pre-Neogene. Old interpretation are re-evaluated and fit to new concepts of structural geology. The updated models are used by geophysicists to regenerate the velocity model to allow enhanced processing of the 3D seismic data.
The modification of the geological model is a continuous process which even goes on while drilling a well. Since the OMV laboratory developed rapid sample characterisation methods, within hours changes to the model are applied and fed beck to the operation on the well site.
The fast reaction processes allows successful drilling complex settings as the intensely faulted Northern Calcareous Alps.

Petrographic characterization of raw materials used for production of LaTène whetstones in Moravia.

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The work focuses on the petrographic characterization of raw materials used for production of whetstones in LaTène time in the area of Moravia. About one hundred whetstones from 13 different Celtic localities from Middle and South Moravia were studied. For the study of the samples the following methods were used: polarization microscopy, hot-cathode luminescence and electron microprobe. Each sample was briefly petrographically described and all samples were divided into functional groups of rocks. The main finding of the study is that most of the whetstones are made of various types of sandstone. Finally, in comparison with the geological map the