Geophysical Research Abstracts,
Vol. 10, EGU2008-A-12436, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-12436
EGU General Assembly 2008

Permian-Paleogene temperature and burial evolution of the NW Polish Basin - evidenced by maturity modelling and apatite fission-track dating

M. Resak (1), **U.A. Glasmacher (**2), M. Narkiewicz (3), R. Littke (1)

(1) Institute of Geology and Geochemistry of Petroleum and Coal, RWTH Aachen University, littke@lek.rwth-aachen.de

(2) Institute of Geology and Paleontology, University of Heidelberg, Ulrich.A.Glasmacher@urz.uni-heidelberg.de

(3) Polish Geological Institute, Warsaw, marek.narkiewicz@pgi.gov.pl

The Polish Basin (PB) belongs to the easternmost part of the Central European Basin System (CEBS). Permian-Mesozoic sediments of the system extend from the North Sea and British Isles in the west to the Baltic countries in the east. The structural element that dominates within the PB is the Mid-Polish Swell (MPS) inverted along with many other CEBS subbasins at the end of Cretaceous and beginning of Paleogene. The MPS evolved from the axial part of the Mid-Polish Trough (MPT) characterized by the thickest sediments deposited before inversion.

The study area is located in northwestern Poland within the Pomeranian segment of MPT/MPS, which experienced a considerable subsidence (up to 7 km until the Late Cretaceous). In order to study Permian to recent burial-uplift evolution of the depocentral and marginal parts of the MPT, 1D modelling was performed on several well sections. The modelling, calibrated with existing and new vitrinite reflectance measurements, allowed constraining magnitude of uplift and related erosion which most probably reached 2400 meters in total. However, the modelled thickness of the Late Cretaceous deposits in the inverted area did not exceed 500 m and probably corresponded to 200-300 m, as compared with 600-2000 m in the adjacent non-inverted parts of the basin. These results suggest an early onset of the inversion process, prob-

ably in the late Turonian or Coniacian.

During the modelling procedure the reconstructed subsidence-uplift pattern of the PB was linked to its temperature history. Information on past temperatures was derived from two sets of data: i) maturity of organic matter expressed in general by vitrinite reflectance and ii) apatite fission-track ages measured in Permian sandstones and volcanics. Implementing these results into modelling aimed to resolve possible thermal events (e.g. one in the late Permian-Early Triassic that could have been related to a major extensional tectonic phase) as well as the thermal regime during the time of the deepest burial in the Late Cretaceous.