

BURIAL AND THERMAL HISTORY OF THE ASYMMETRICAL RIFT BASIN: A CASE STUDY FROM THE POLISH BASIN

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The evolution of the Polish Basin Basin-fill took place from the Rotliegend (Late Permian) until the Late Cretaceous when, due to inversion of the central part of the basin, the Mid-Polish Anticlinorium was uplifted. The burial history of the Polish Basin reveals that the Late Permian and Early Triassic periods represent the main rifting phase and its later development resulted from thermal relaxation. Analysing thermal history of the Polish Basin-fill it was surely evidenced that at the beginning of the Rotliegend volcanic period the high geothermal anomalies (100-150mWm⁻²) occurred in the western part of the developing basin. Such high values were related to syn-rift stages of sedimentary basin development. During Late Triassic and Jurassic time some cooling of rift heat field took place, but the turning point in thermal evolution of the Polish Basin was at the Jurassic/Cretaceous boundary when the southwestern part of the Polish Basin was uplifted and intensively eroded. Results of burial and thermal analysis of the Polish Basin as well as configuration of Moho surface in Poland seem to suggest the asymmetrical style of the basin model. The uppermost position of Moho is additionally accompanied by a very high helium concentration and corresponds to the area of the highest heat flow during the Late Permian, Triassic and Jurassic in the whole Polish Basin. It may be settled that the described palaeothermal-geochemical-tectonic anomaly represented the Late Permian-Early Mesozoic rifting process.