

THERMAL HISTORY OF NORTH CHINA BASIN, A REACTIVATED CRATONIC AREA

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North China Basin (NCB) is a Meso-Cenozoic basin developed on Pre-Cambrian cratonic basement and viewed as a continental rift, rift and/or graben. Based on 165 heat flow measurements and paleo-geothermal studies, the thermal history of the basin has been reconstructed. Results indicated that the thermal history of NCB can be traced back to Mesozoic era. Before that, the NCB had undergone a stage of cratonic development for a long time. Its surface heat flow at that time is believed to be of the order of $\sim 40 \text{ mW/m}^2$. Beginning at the end of Cretaceous and extending into Paleogene (80 to 90 Ma) to 25 Ma, a major thermal perturbation occurred in NCB due to the big change in tectonic settings of the West Pacific. High heat flow around 85 mW/m^2 was recorded by the paleo-geothermometers. By the end of Paleogene (40 to 20 Ma), motion of the Pacific Plate changed from NNW to NWW, resulting in decreasing of rifting development in NCB. Consequently, the high thermal regime decayed rapidly. However, due to the blanket effect of the Cenozoic sediments and rather short time interval of decay since the Paleogene rifting event, NCB still retains a relatively high geothermal background ($\sim 63 \text{ mW/m}^2$). Therefore, a unique thermal regime and structure of the lithosphere neither similar to typical cratonic area nor to tectonically active units was thus observed in North China Basin nowadays.