

论文

江汉盆地热流史、沉积构造演化与热事件

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摘要 江汉盆地是我国前新生代海相油气勘探的重要领域之一, 为研究海相烃源岩的热演化史提供地热学参数, 以镜质体反射率(R_o)为古温标进行热史反演, 获得了盆地的热流史. 印支运动以前, 盆地基底热流为 $50\sim 55\text{mW/m}^2$; 晚印支—早燕山期, 热流整体升高; 不同构造单元达到最高古热流的时间不同, 潜北断裂以北, 157Ma 左右达到最高古热流($\sim 72\text{mW/m}^2$), 潜北断裂以南, 43Ma 左右达到最高古热流($71\sim 76\text{mW/m}^2$); 晚喜山期, 热流迅速降低, 盆地快速冷却. 盆地热流史和沉积构造演化、岩浆活动热事件的耦合关系表现为: 印支运动以前, 海相盆地稳定建造阶段为统一的低热流背景, 岩浆活动微弱; 晚印支—早燕山期, 构造活动性增强产生深部热搅动, 热流整体升高; 中燕山期挤压改造变形阶段热流值的高低受控于岩浆活动热事件的分带表现, 盆地基底热流表现为北降南升; 晚燕山—早喜山期, 陆相伸展盆地建造与叠加改造阶段, 岩浆活动热事件的区域特征决定热背景分区; 晚喜山期, 盆地萎缩, 为热流值降低的冷却过程.

关键词 [江汉盆地](#) [热流史](#) [沉积构造演化](#) [热事件](#) [耦合关系](#)

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Heat flow history, tectono-sedimentary evolution and thermal events of the Jianghan basin

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Abstract Jianghan basin is one of the significant domains of the hydrocarbon exploration of the Pre-cenozoic marine basins in China. The thermal history is the main factor of controlling the thermal maturation of the source rocks in a basin. Based on the paleo-thermometric indicator of vitrinite reflectance (R_o), the thermal history is reconstructed. The results show that the basal heat flow was relatively low ($50\sim 55\text{mW/m}^2$) before Indosinian movement. From the late Indosinian to early Yanshanian episode, however, the heat flow was elevated within the whole basin. The heat flows reached their maximum values of $\sim 72\text{mW/m}^2$ at about 157Ma in the north of the Qianbei Fault and $71\sim 76\text{mW/m}^2$ at around 43Ma in the south of the Qianbei Fault, respectively. Since the late Himalayan period, the heat flow decreased quickly and the basin was cooled consequently. The heat flow history, tectono-sedimentary evolution and magmatic activities of the basin were mutually coupled. Jianghan basin was a stable craton with weak magmatic movements before the Indosinian movement as a result, the heat flows were characterized by low values. During the late Indosinian-early Yanshanian period, the structural movements became more intensive and the heat flows were elevated simultaneously. During the middle Yanshanian period, the intensity of the magmatic activities controlled the heat flow which was decreasing in the north and increasing in the south of the basin. Since the late Himalayan epoch, The Jianghan basin has been subjected a deposition withering period accompanied by a cooling episode.

Key words

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