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北大别北东地区榴辉岩温度条件分析

作者	单位	E-mail
石永红	合肥工业大学资环学院,合肥 230009	
康涛	合肥工业大学资环学院,合肥 230009	
李秋立	中国科学院地质与地球物理研究所岩石圈演化国家重点实验室,北京 100029	
林伟	中国科学院地质与地球物理研究所岩石圈演化国家重点实验室,北京 100029	linwei@mail.iggcas.ac.cn

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摘要：

北大别榴辉岩温度条件的精确评价直接涉及到北大别变质单元性质的判定。由于榴辉岩温度分类方案的不同,以及温度估算时温度计选择和绿辉石Fe^{2+}校正方法不同的影响,导致北大别榴辉岩温度评价和分类归属具有较大的不确定性。为此,本研究应用5个不同的温度计和4种不同的绿辉石Fe^{2+}校正方法,评价了北大别北东地区榴辉岩的温度条件。研究显示,当应用Krogh (2000) 的Grt-Cpx Fe-Mg温度计和设定绿辉石的铁为$Fe^{3+}/Fe^{2+}=1:1$时,温度计算较为合理:$P_{标定}$=3.5GPa,温度范围为600~740℃或$P_{标定}$=5.0GPa,温度范围为670~810℃。参照Carswell (1990)的温度分类,北大别榴辉岩应属于中温类型。但结合此次榴辉岩的地质特征、岩相学和矿物成分分析,以及前人的研究资料,北大别榴辉岩与中大别和南大别榴辉岩有明显的差异,其可能是在相对高温的条件下形成的。

英文摘要：

The precise temperature estimation for eclogits across the North Dabie Terrane (NDT) is the most critical to determine the characteristics of the North Dabie metamorphic units correctly. The many uncertainties on the peak temperature estimates and the classification of eclogites across the NDT had arose, as the different thermometers and methods of Fe^{2+}correction of omphacite had been employed to evaluate the *P-T* values, and the different scenarios for the classification of eclogites had existed. To investigate this issue, 5 thermometers and 4 methods for ferric correction of omphacites have been used to calculate the temperature conditions for eclogites in the northeastern part of the NDT in this study. When the Krogh (2000) Grt-Cpx Fe-Mg thermometer has been employed and the ferric in omphacite has been assumed as $Fe^{3+}/Fe^{2+}=1:1$, the temperature estimated ought to approach to the real values. The results indicate: $P_{calibration}$=3.5GPa, the temperature is in the range of 600~740℃; $P_{calibration}$=5.0GPa, the temperature is in the range of 670~810℃. Refer to the classification of eclogites from Carswell (1990), the eclogites across the NDT can be considered as the medium temperature eclogites. However, the eclogites from the NDT display different characters from those in the Central Dabie and South Dabie terranes, based on the investigations of geological characteristics, petrographic studies, the analysis of mineral compositions and the results of previous studies for eclogits from the NDT, we conjectured that the eclogites across the NDT underwent higher temperature metamorphism.

关键词：榴辉岩 峰期温度 绿辉石 Fe^{2+}校正 北大别地块

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