

引用本文(Citation):

蔡书慧, 贺怀宇, 朱日祥. 燕山地区承德盆地下白垩统磁性地层学研究 及其对华北克拉通破坏的制约. 地球物理学报, 2012,55(1): 66-75,doi: 10.6038/j.issn.0001-5733.2012.01.007

CAI Shu-Hui, HE Huai-Yu, ZHU Ri-Xiang. Magnetostratigraphic study of lower Cretaceous at Chengde Basin, Yanshan area and its restriction on North China Craton destruction. Chinese J. Geophys. (in Chinese), 2012, 55(1): 66-75, doi: 10.6038/j.issn.0001-5733.2012.01.007

燕山地区承德盆地下白垩统磁性地层学研究 及其对华北克拉通破坏的制约

蔡书慧^{1,2}, 贺怀宇¹, 朱日祥^{1*}

1. 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;
2. 中国科学院研究生院, 北京 100049

Magnetostratigraphic study of lower Cretaceous at Chengde Basin, Yanshan area and its restriction on North China Craton destruction

CAI Shu-Hui^{1,2}, HE Huai-Yu¹, ZHU Ri-Xiang^{1*}

1. State Key Laboratory of Lithospheric Evolution, Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing 100029, China;
2. Graduate University of Chinese Academy of Sciences, Beijing 100049, China

摘要

参考文献

相关文章

Download: PDF (699KB) HTML 1KB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 华北克拉通破坏的重要标志是岩石圈减薄、地幔性质转变以及伸展构造活动。长期以来这一重大地质事件发生的时代备受关注, 目前已有大量地质、地球物理和地球化学研究结果, 但对于华北克拉通破坏的准确时代, 尚存争议。本文试图从地磁学的角度为华北克拉通破坏时代提供可靠约束。选取位于华北克拉通北缘的燕山造山带中段—承德盆地作为研究对象。磁性地层学研究结果表明研究剖面记录了三个磁极性段: 下部正极性段(N2)、中部负极性段(R1)和上部正极性段(N1), 与2004年地磁极性年表对比并结合129~128 Ma的火山岩同位素年龄(与B. Schoene 私人通信), 认为剖面下部正极性段(N2)对应于M3n, 负极性段(R1)对应于M1r, 上部正极性段(N1)对应于M1n, 由此得出承德盆地袁家庄剖面沉积作用起始年龄约为128 Ma。作为华北克拉通重要断陷盆地之一, 承德盆地的沉积年龄可以为华北克拉通破坏时代提供有力约束。岩石磁学研究结果表明, 研究剖面火山岩的剩磁载体十分复杂, 可能与伴随华北克拉通破坏峰期出现的地壳变形、岩浆活动、地幔上涌、下地壳重熔等深部动力过程密切相关。综合分析结果表明, 华北克拉通破坏的峰期为128~125 Ma。

关键词 磁性地层, 早白垩世, 承德盆地, 伸展构造

Abstract: Lithosphere thinning, mantle property transforming and extensional tectonic activity are important performances of the North China Craton destruction. The timing of North China Craton destruction has been continuous paid attention to. There have already been plenty of research from Geology, Geophysics and Geochemistry. However, the exact destruction age of North China Craton is still controversial. In this paper, we try to put forward geomagnetic evidence of the peaking destruction age of North China Craton. Yanshan orogen is located at the northern edge of North China Craton and affected significantly by its destruction. Chengde Basin is located at the middle section of Yanshan orogen, which makes it an ideal area for studying the basin record of North China Craton destruction. Specific geomagnetic study is carried out at the area. The rock-magnetic results indicate that magnetic minerals of volcanics are complex, including magnetite, maghemite and hematite while sedimentary magnetic minerals are mainly magnetite, possibly including small amount of maghemite and hematite. The complexity of volcanic magnetic minerals may be closely related to the deep dynamic process of crustal deformation, magmatic activity, mantle upwelling and lower crustal remelting accompanying with the peak age of North China Craton. An age of 129~128 Ma is obtained from the radiometric dating result(private communication with B. Schoene). Magnetostratigraphic result shows three polarity sections: the lower normal section(N2), the middle reversal section(R1) and the upper normal section(N1). Comparing with the Geologic Time Scale 2004 and combining the radiometric dating result, it is believed that the N2 section is related to M3n, R1 related to M1r and N1 related to M1n. Therefore, it is concluded that Chengde Basin starts to sedimentate at about 128 Ma, which is a strong constraint on the peaking age of North China Craton destruction. Synthesizing the Geologic, Geophysical and Geochemical results, a peak destruction age of 128~125 Ma is obtained, which is supported by the appearance age of a great quantity of extensional tectonics(135~115 Ma) and peak transition(from N—S contraction to NWW—SEE extension led by subduction of Paleo-Pacific Plate and closure of Mongolia-Okhotsk Sea in late Mesozoic) age of dynamic mechanism at North China Craton(128~125 Ma). It is inferred based on existed

Service

- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- Email Alert
- RSS

作者相关文章

research that North China Craton destruction is the primary element leading to formation of the great quantity of rift basins in late Mesozoic at Yanshan area. One of the shallow responses accompanying with the peak age of North China Craton destruction is regional extensional activity and formation of rift basin. It is characterized by the appearance of metamorphic core complexes at the northern rim of the North China Craton, which may be related to magmatic activity caused by detachment of lower crust. The deep dynamic is due to instability of mantle convection system at the eastern part of the North China Craton arose from physical and chemical processes such as subduction and dehydration of the Pacific Plate.

Keywords [Magnetostatigraphy](#), [Early Cretaceous](#), [Chengde Basin](#), [Extensional tectonics](#)

Received 2011-04-06:

Fund:

国家自然科学基金重大研究计划(90814000)资助.

Corresponding Authors: 朱日祥,中国科学院院士,主要从事地磁学与地球动力学方面的研究. E-mail: rxzhu@mail.iggcas.ac.cn. Email: rxzhu@mail.iggcas.ac.cn

About author: 蔡书慧,女,1985年生,博士研究生,主要从事地磁场古强度及考古磁学方面的研究. E-mail: caishuhui@mail.iggcas.ac.cn.

链接本文:

<http://118.145.16.227/geophy/CN/10.6038/j.issn.0001-5733.2012.01.007> 或 <http://118.145.16.227/geophy/CN/Y2012/V55/I1/66>

[查看全文](#) [下载PDF阅读器](#)