

不同类型沉积物磁化率的比较研究和初步解释

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中文摘要:沉积物的磁化率分析已被广泛应用在第四纪古气候研究中,不同类型沉积物磁化率的解释可能存在明显的差异.本文选择了黄土、冲积物、湖积物、风沙堆积和南方红土等五种不同类型的沉积物,进行了磁化率的测试,粒度和孢粉分析,试图通过对沉积物磁化率和相关古环境指标的研究,对不同类型沉积物的磁化率予以对比并进行初步解释.研究表明,黄土和湖泊沉积中磁化率的变化主要受气候变化的影响,是指示古气候的重要指标;河流沉积物和风沙沉积物的磁化率主要受粒度的影响;影响南方红土磁化率的因素十分复杂,其磁化率的解释比较困难有待进一步的研究.这一研究表明,鉴于不同沉积物磁化率的影响因素存在明显的不同,因此在运用磁化率进行古环境解释时须持慎重态度.

中文关键词:磁化率 第四纪古气候 黄土 湖泊沉积 河流沉积 风沙沉积 南方红土

Comparison and Primarily Interpretation of Magnetic Susceptibilities in Different Sediments

Abstract: Magnetic susceptibility has been widely used in Quaternary paleoclimate studies in recent years, with good results obtained. Nevertheless, some scientists have pointed out that, due to the complexity of its mechanism, the magnetic susceptibility interpretations for different types of sediments show obvious diversity. Five types of sediments, i.e., loess, river sediments, lake sediments, aeolian sediments and red earth, were chosen from South China for magnetic susceptibility measurement, grain-size measurement and pollen analysis. Based on a comparison between the magnetic susceptibility and other related paleoenvironment indicators, the authors tried to study the factors affecting magnetic susceptibilities in different types of sediments so as to provide scientific evidence for the correct interpretation of magnetic susceptibilities. It is held that, as the factors affecting the magnetic susceptibility are diverse in different types of sediments, we should use different means to interpret different magnetic susceptibilities. Magnetic susceptibility can be used to indicate the paleoclimate changes in loess and lake sediments, for it is affected mainly by climatic changes. Magnetic susceptibility in river sediments is mainly affected by grain sizes which have close relationship with the dynamical condition and physiographic position of the river, and hence it can serve as evidence of dynamical environment, but cannot respond to the climatic changes. In aeolian sediments, magnetic susceptibility is also mainly influenced by grain sizes which are closely related to the power and direction of the wind. The factors affecting the magnetic susceptibility in red earth are very complicated: not only the original characteristics but also the subsequent strong eluviation and weathering can affect the magnetic susceptibility. So the interpretation of magnetic susceptibility of red earth is controversial and needs further study. It is thus concluded that, as magnetic susceptibilities in different types of sediments are obviously affected by many different factors, the interpretation of magnetic susceptibilities has to be conducted with great care.


keywords: magnetic susceptibility Quaternary paleoclimate loess-paleosoil lake sediments river sediments aeolian sediments red earth in South China

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