

气候环境变化研究中影响粘土矿物形成及其丰度因素的讨论

A discussion on the factors affecting formation and quantity of clay minerals in climatic and environmental researches

中文关键词: [气候环境变化](#) [粘土矿物](#) [形成因素](#) [丰度](#)

英文关键词: [climatic-environmental changes](#) [clay minerals](#) [formation factors](#) [abundance](#)

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中文摘要:

粘土矿物在形成过程中受构造运动、气候、盆地规模、地表母岩、土壤、植被、地貌、介质环境、风以及成岩作用等多种因素的影响, 这些因素对地层中粘土矿物的类型和含量的影响程度不一。构造运动和气候是影响粘土矿物形成的两个主要因素, 对沉积物中的粘土矿物形成和含量以及影响粘土矿物形成的其他次要影响因素有着控制作用。在构造活动稳定的状态下, 气候则成为影响粘土矿物形成和含量的决定性因素, 其他因素尽管也有不同程度的影响, 但可以看成是相对稳定不变的, 粘土矿物携带的主要是气候环境变化的信息。地表水系的复杂程度引起的沉积物的混合程度影响粘土矿物信号的清晰度, 沉积埋藏成岩作用对粘土矿物的影响也不容忽视。

英文摘要:

Clay minerals have such main types as illite, chlorite, smectite and kaolinite. They could record rich information of climatic and environmental changes during their formation and hence are good proxies in climatic and environmental study. Many factors such as tectonic movement, climate, basin size, surface parent rocks, soils, vegetative cover, landscape, water media properties, wind and diagenesis, affect the clay mineral formation. The types and quantity of clay minerals in strata depend on these factors in varying degrees. Tectonic movement and climate are two primary factors which dominate the types and quantity and control other secondary factors which influence clay mineral formation. It is very difficult and unsuitable to analyze climatic and environmental changes during the tectonic movement phase only by clay minerals. For a long geological time which has tectonic movement, sedimentary facies and palaeogeography must be used to decipher palaeogeography and palaeo-environment information. However, under stable tectonic movement, which spans usually a short geological time, other information factors keep stable and clay minerals are formed mainly through climatic factors. They record the real information of climate and environment changes and hence can be used as climatic proxies. Basin change of climate and environment could be inverted. So, climate is the key factor for forming clay minerals and determining their amounts. Strata-tectonic analysis must be done when clay minerals are used to decipher climatic and environmental information. In a word, when tectonic movement is stable, climate becomes the dominate factor affecting clay mineral formation. The other secondary factors keep invariant and clay minerals carry the major climatic information, and they can be used to decipher climatic and environmental history. The mixture of clay minerals caused by ground hydrographic systems affects the signal clearness of clay minerals carrying major climatic information and environments. Sedimentary-buried diagenesis of clay minerals in strata shouldn't be ignored in analysis.

孙庆峰, Christophe Colin, 陈发虎, 张家武, 2011, 气候环境变化研究中影响粘土矿物形成及其丰度因素的讨论[J]. 岩石矿物学杂志, 30(2): 291-300.

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