

Climatic and Tectonic Evolution during about 27-13 Ma of the northeastern part of the Qinghai–Tibetan Plateau evidenced by geochemical and mineralogical records in the Xunhua Basin

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The Xunhua Basin which located at the northeastern part of the Qinghai–Tibetan Plateau provides a valuable opportunity to understand the climatic and tectonic evolution of Qinghai–Tibetan Plateau. Here we present a synthesis of clay mineralogy, bulk mineral composition and bulk-rock geochemistry of sediments during about 28-14 Ma in the Xunhua Basin. Climate changes during the episode were documented in the sediments and were expressed by the proportion of clay species (Smectite, illite, chlorite) and clay indices, the proportion of non-clay minerals (calcite, quartz, gypsum, orthoclase, and plagioclase), as well as chemical weathering indices, Rb/Sr and Ba/Sr ratios. The results suggest that a warm and seasonally dry and humid climate prevailed over the period ~27-25 Ma, followed by a relatively cold and dry climate in the period ~25-23 Ma. During the period ~23-17Ma, the climate is colder and drier than the previous period and a subsequently warm and humid climate in the period ~17-13 Ma. The dramatic reduction of chlorite proportion at 23 Ma suggested that the source materials changed because of the uplift of mountains around such as Laji mountain. The climate in Xunhua Basin could have been controlled by global climate and the climate cycles of the East Asian monsoon might add additional influence.

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