

The variation of weathering and pedologic signals of late Pleistocene loess paleosol sequences in Inner Mongolia, China

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A new section of the late Pleistocene loess-paleosol sequences exposed at Inner Mongolia and Liaoning Province, northeastern China, was studied for stratigraphy, major chemical- and mineral- composition by X-ray fluorescence analysis and powder X-ray diffraction analysis, and color reflectance, magnetic susceptibility. As the result, it can emphasize that CIW and Al_2O_3/SiO_2 ratio are more sensitive than magnetic susceptibility and color change as the summer monsoon parameter indicating the degree of soil formation.

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The chemical index of weathering ($CIW = Al_2O_3/(Al_2O_3+CaO+Na_2O)$) and Al_2O_3/SiO_2 ratio based on chemical composition of loess-paleosol sequences, are known as a good indicator of the pedogenesis promotion from loess as the mother material. Also in Tien Shang loess section, the parameters of CIW and Al_2O_3/SiO_2 ratio show the paleosol layers identified field observation have the high CIW value and the high ratio in contrast with the loess layers. And these oscillation are wider than the oscillation of magnetic susceptibility and L^* . All parameters indicate the paleo summer monsoon activity change promoted soil formation. Therefore, it can emphasize that CIW and Al_2O_3/SiO_2 ratio are more sensitive as the summer monsoon parameter indicating the degree of soil formation. If it can adapt the chronology model using the Chinese Loess Plateau region, the loess-paleosol sequence in Tien Shang have dated between the oxygen isotope stage 6 and Holocene. On the basis of CIW and Al_2O_3/SiO_2 ratio, it can be recognized that the three period warm stages in stage 5.5. The result is not contradict with the other regions.