

## **Geochemical characteristics evidence for the provenance of loess in Changdao Islands, eastern China**

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We investigate the geochemical composition and provenance of the Changdao Island loess, and compare them with other typical loess deposits in northern China. The results of the geochemical characteristics of major elements indicate that the content of major element oxide is mainly composed of SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub> and CaO. The compositional abundance of major element are in an order of SiO<sub>2</sub> > Al<sub>2</sub>O<sub>3</sub> > CaO > Fe<sub>2</sub>O<sub>3</sub> > Na<sub>2</sub>O > K<sub>2</sub>O > MgO. The proportion of Na<sub>2</sub>O of Changdao loess is obvious higher than the Luochuan loess, while it is still quite lower than that of upper continental crust. The CIA value of Changdao loess sequence is between 54.64 and 71.78, suggesting weak chemical weathering intensity under cold and dry climatic conditions to median chemical weathering intensity. The Changdao loess and other aeolian deposits follow the similar trend line in the A-CN-K diagram, suggesting that the loess sources have finished multiple cycles of weathering, erosion, transport and deposition of crustal material. The changes of CIA, Na/K, the Eluvial Coefficient and the Coefficient of Weathering and Eluviations indicated the difference provenance between Changdao Loess and the typical loess deposits. The results of chemical weathering intensity inferred from CIA and Na/K shows that the Changdao loess sequence should have similar chemical weathering intensity to the Dalian loess in the south of Liaoning province, which has the similar geographical location an natural environment, this may indicates that the provenance of Changdao Loess must have the same transport mechanism and depositional environments.