A Big Earth Data Platform for Three Poles

**A weathering data set about the Cenozoic climate and environment evolutions within and around the Tibetan Plateau**

1、Description

The Cenozoic terrestrial chemical weathering records from the surrounding areas of the Tibetan Plateau are of great significance for understanding the relationship between Tibetan Plateau uplift, chemical weathering and global cooling. In this study, detailed mineralogical and geochemical analysis were performed on the early Cenozoic sediments from the Hongliugou section (54-26 Ma) in the Qaidam Basin, the Xiejia section in the Xining Basin (52-26 Ma) and the Caijiachong section in the Qujing Basin (46.6-36 Ma). Then a comprehensive chemical weathering history of the Early Cenozoic (54-26 Ma) in the northeastern and southeastern Tibetan Plateau was established. Specially, clay minerals of 315 samples from the Hongliugou section, 131 samples from the Xiejia section and 230 samples from the Caijiachong section were analyzed using Bruker D8+ X-ray diffraction analyzer. Major and trace elements of 310 samples from the Hongliugou section, 120 samples from Xiejia section and 201 samples from the Caijiachong section were analyzed using inductively coupled plasma optical emission spectrometry (ICP-OES; Leeman Labs Prodigy-H) and inductively coupled plasma mass spectrometry (ICP-MS; X-7; Thermo-Elemental, USA), respectively. While the hematite content of 835 samples from the Hongliugou section were determined using a Purkinje General TU1901 UV-VIS spectrophotometer. The regional chemical weathering intensity as suggested by clay mineral assemblage (i.e. (illite/smectite mixed layers + smectite)/illite), elemental geochemical indices (e.g., CIA) and hematite content shows a long-term decreasing trend in 54-26Ma, resembling the contemporary benthic oxygen isotopes variations, thus indicating that global temperature is the main controlling factor regulating the reginal chemical weathering in the early Cenozoic.

2、Keywords

Theme：Major elements,Trace elements,Chemical Weathering,Geochemistry,Clay mineral,Paleoclimate Reconstruction,Sedimentary Record
Discipline：Palaeoenvironment,Solid earth
Places：Xining Basin, Qujing Basin, Qaidam Basin
Time：Eocene

3、Data details

1.Scale：None

2.Projection：None

3.Filesize：0.1MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.13 | - |
| west：94.68 | - | east：104.0 |
| - | south：25.0 | - |

5、Time frame:None--None

6、Reference method

References to data:

HAN Wenxia, HAN Wenxia , FANG Xiaomin , FANG Xiaomin. A weathering data set about the Cenozoic climate and environment evolutions within and around the Tibetan Plateau. A Big Earth Data Platform for Three Poles, doi:10.11888/Paleoenv.tpdc.2720012022

References to articles:

Fang, X.M., Galy, A., Yang, Y.B., Zhang, W.L., Ye, C.C., & Song, C.H. (2019). Paleogene global cooling–induced temperature feedback on chemical weathering, as recorded in the northern Tibetan Plateau. Geology, 47(10), 992-996.

Lü, S., Ye, C.C., Fang, X.M., Appel, E., Han, F.Q., & Yan, M.D., et al. (2021). Middle to late Eocene chemical weathering history in the southeastern Tibetan Plateau and its response to global cooling. Palaeogeography, Palaeoclimatology, Palaeoecology, 562, 110136.

7、Supporting project information

The Second Tibetan Plateau Scientific Expedition and Research Program (STEP)(2019QZKK0707)

8、Data resource provider

name: FANG Xiaomin
unit: Institute of Tibetan Plateau Research, CAS
email: fangxm@itpcas.ac.cn

name: FANG Xiaomin
unit:
email: fangxm@itpcas.ac.cn

name: HAN Wenxia
unit:
email: wenxia\_han@163.com

name: HAN Wenxia
unit: Linyi University
email: wenxia\_han@163.com