The comparsion of Mo isotope and paleo-oxygenation parameters in black shales from Upper Yangtze marine sediments

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This paper investigates the high-solution of Mo isotopes and uses trace-element analyses for fresh and representative black shales and siliceous shales collected from the transition between the Late Ordovician and the Early Silurian at the Wangjiawan section in Yichang and the Late Permian Dalong Formation in the Shangsi Section of Sichuan. The applicability of different geochemical parameters used as paleo-oxygenation indices are also compared. The preliminary results show that V/(V+ Ni), U_{auth}(auth U), V/Cr, Ce_{anom} and U/Th have a scattered variation range, but most samples plot within the suboxic-anoxic fields. The suboxic-anoxic environment was dominant during the deposition and formation of the two anoxic facies. These redox indicators show little correspondence to the δ^{98}Mo values. The U/Mo ratio can be used as a potential proxy for the paleo-redox conditions due to the possibility that Mo is enriched relative to U at different redox gradients during early diagenesis. This evidence is more significant for the euxinicity condition and corresponds to positive δ^{98}Mo (>1.5‰) values with low U/Mo ratios. This evidence is likely related to the depositional conditions near the boundary between anoxic and euxinic environments, which are characterised by low bioturbation or water circulation. Other samples reveal a wide scatter of U/Mo ratios and δ^{98}Mo <1.5‰. These results are likely due to punctuated improvements in oxygenation with intense bioturbation or water circulation, which led to the redistribution of trace element.

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Study on glaciochemical and microparticle characteristics of three snow pits in East Antarctica

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In the Antarctic summer of 1998/1999, the third Chinese Trans-Antarctic inland glaciological scientific expedition successfully entered Dome A area and extended its research to the site of 79°16'S, 77°00'E, 3,931 m.a.s.l, 1,128km away from Zhongshan station. We present the glaciochemical and microparticle characteristics of three snow pits which were drilled at the 1128km(DAP1), 1000km(DAP2) and 800km(DAP3) site along the investigation route.

From the dating results of the three snow pits, we come to a conclusion that the DAP1 snow pit, which was 3.3m deep, represented the whole sediments from 1987 to 1998; while DAP2 snow pit which was 2.1m deep represented a 7-year long sediment from 1992 to 1998 and DAP3 snow pit of 2.4m deep represented a 8-year long sediment from 1991 to 1998. Comparing the different radius part of the microparticles in the snow pits, we find that they are well linear related which implicates that the main source of the microparticles is the remote continents and the local factors have weak influence on them. The concentration of microparticles also coincides with the accumulation rate, that is, high microparticle concentrations agree with high accumulation.

From the glaciochemical analysis results, we find that the concentration of calcium in the snow pits changes smoothly, which implicates that it is from the deposit of the remote continents and the local influence is not evident. But for DAP3 snow pit, the calcium concentration slightly fluctuates for the unknown local causes. The sulfate in the snow pit exhibits a noticable wave crest for the eruption of Pinatudo volcano in 1991, which verifies the preciseness of the snow pit dating. What's more, the precipitation calculated by the snow pits well agree with the trend of global warming. The snow pit contains instructive information on the sedimentary characteristics and the climate change.

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