Paleoclimate Record of Variation of the organic carbon(TOC) in Chinese Loess Section since 0.15Ma B.P.

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1.Sampling and methods

Samples came from Luochuan Loess section in Shaanxi province. Samples involved S_0_L_1 and S_1. Samples were continuously obtained, and thickness of every sample was 10 centimeter. There were 91 piece of samples. The organic carbon was measured by sulfuric acid/dichromate oxidation.

2.Discussion of results

Mean value of the organic carbon (TOC) is 0.26%(Table1) in Luochuan section, lower than Weinan section. This fact shows TOC concentrations gradually increase from north to south of Chinese Loess plateau, and implies that climate has an important effect on creatures. In addition, TOC concentrations in Luochuan loess section (S_0-L_1-S_1) gradually decrease from top to bottom. But TOC concentrations in paleosoil is usually higher than those in Malan Loess. Finally, Fig.1 shows that Variation of TOC in Luochuan section is similar to that in Weinan loess section[1]. Variational curve of TOC of Chinese loess section represents great three change of climate, and there are little two fluctuations of climate in Malan loess(Fig.1). Variation of TOC is well consistent with Variation of magnetic susceptibility in Luochuan and Weinan loess section[1].

Table 1 Mean value (%) of the organic carbon in different layers of Luochuan and Weinan Section

layers	Luochuan section	Weinan section
S0	0.47(5)	0.35(29)
L1	0.25(75)	0.29(99)
S1	0.27(8)	0.33(93)
_S+L	0.26(91)	0.28(221)

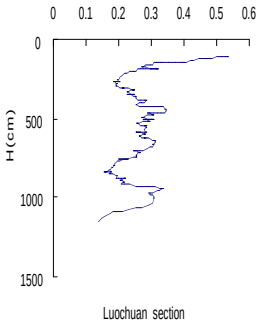

Fig.1 Distribution of TOC content(%) with depth in Luochaun Loess Section

3.Conclusion

Content of TOC has a good relation with climate change. Therefore, the organic carbon can be a better character to record change of paleoclimate to some extent.

Reference

1 Liu youmei, Jia rongfen. The Periodicity of Organic Elements in the Yangguo Loess Section of Weinan and Paleoclimatic Evolution. Sedimental transaction, 1996, Supplement:136-142

Rheology of the Proterozoic massif anorthosites

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Introduction

Many investigators of the petrogenesis of Proterozoic massif anorthosites believe that extensive crystallization of a mantle-derived magma ponded at or near the base of the crust that produces suspension of plagioclase in Fe-rich, high-Al gabbroic liquids and later followed by the intrusion of the suspensions into the mid-Upper crust where they form complex magma chambers (1).

It is not clearly known why did a highly buoyant mantle-derived magma pond at or near the base of the crust and subject to extensive crystallization leading to the production of high-Al Opx megacrysts which preserve a record of high pressure stage. In fact the buyant magam should have intruded into the mid-Upper crust through rifts in the crust and crystallized as it happened in the case of Labrador anorthosites (which show little or no deformation) . It implies that mantle - derived magmas were forced to pond at or near the base in the crust due to lack of rifts for intrusion into the crust in the Greville and Sveconorweigian provinces. Similarly it is not known what forced the crystal mushes after their formation from the lower to mid-Upper crust (through a distance of 20-25Km)

The Petrogenetic Scheme

Therefore the author (4) presents the view that the mantle-derived magmatic melts ponded at or near the base of the crust due to lack of rifts for upward movement, experienced Sorect effect (3) above they liquidus due to which certain elements (Fe, Ti,P, Ca, Mg, etc.) migrated and concentrated at or near the cooler margins of the magma pools while the hot regions of the magma pool got enriched in Si, Al, Na, K, Mn, etc., On crystallization high Al -Opx megacryst were produced at depth. The bulk of the remaining hyperfeldspathic magma crystallized at depth and remained there at very high lithostatic pressure. The deep seated anorthosite plutons which were under enormous lithostatic pressure(>30km) moved upwards as rheological solids in response to destressing (removal of pressure) due to extensive and intensive removal of a few tens of km of over-burden. The destressing of plutons provided the required driving force for the upward movement of the Plutons (which are now found in deeply eroded mid-Proterozoic orogenic belt in the Grenville province. This forced moment produced melting of the pluton at its margins and also contact rack and variable contamination of the margins and also remelting of the Fe, Ti, P enriched margins of the pluton and other features like domical structure of many massifs, protoclastic structures etc,.

Conclusion

The upward movement of the deep seated plutons, may be the cause for the origian and occurrence of tectonic earthquakes in orogenic belts.