

## Petrologic and Geochemical Characteristics of Marine Sand Strip in the Proterozoic Chuanlinggou Formation of the North China

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**Abstract :** The study of the sedimentary environment of Mesoproterozoic marine deposits in North China has attracted special attention in recent years. It is not clear that the sedimentary environment and the cause of formation of the sandstone strip and its internal carbonate cements and pyrite in the Mesoproterozoic Chuanlinggou Formation in North China. In this study, drilling core samples in North China were identified by microscopy, and their petrological characteristics such as mineral composition and structure were identified. The geochemical data of carbon and oxygen isotopes, total organic carbon (TOC) contents and total sulfur (TS) contents were obtained by processing and analyzing the samples. The samples are mainly quartz particles with low compositional maturity, combined with low value of TOC, it shows that the sedimentary environment of the sandy clastic is a sandy littoral sedimentary environment with relative strong hydrodynamic force, and then the sandstone strip in black shale are formed by the deposition of gravity flow. Analysis of TS values reflect sandstone bands formed in hypoxic environments. The carbonate cements and the pyrite in the sandstone belt are authigenic. The carbon isotope values of authigenic carbonate cements are negatively biased in comparison with the carbonate isotope of carbonate rocks in the same period, but it is more biased than the carbon isotopic values of anaerobic oxidation of methane (AOM) genetic carbonate rocks. Authigenic pyrite may be mainly due to the formation of HS<sup>-</sup> by the action of bacterial sulfate reduction (BSR) and Fe<sup>2+</sup>, their causes are in contact. This indicates that authigenic carbonate cements are mainly carbonate precipitates formed but are significantly affected by the effects of AOM. Summary, the sedimentary environment of the sandstone zone in the Chuanlinggou Formation in the North China is a shallow sea facies with iron rich and anoxic.

**Keywords :** sandstone strip, sedimentary environment, authigenic carbonate cements, authigenic pyrite, The Chuanlinggou group, North China

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