As one of the most significant research targets of the Southern Marine Shale Gas Exploration and Research in China, Niutitang Formation of Lower Cambrian in Southeast Chongqing developed black shale series which enriched in organic matter at its bottom. Its average total organic carbon (TOC) was 3.75%. Shale gas was found mostly in organic matter, while the content of organic matter was mostly controlled by its depositional settings. To understand the depositional settings of the series, as well as the enrichment mechanism of organic matter, mineralogy and geochemical characteristics were analysed. The findings of Couch equation and B/Ga indicated that it was covered by salt water-brackish water and occurred in shallow water on continental shelf when the sediments formed. The redox sedimentary environment was confirmed with the help of the negative anomaly of Ce, the V/Cr ratio, and the appearance of pyrite framboids. Some trace elements and rare earth elements were analysed. Both of these proved that the Niutitang Formation was affected by the fluid from the deep. About the enrichment mechanism of organic matter, the reductibility of the environment would lose its dominant position when it had met the needs of making organmic matter richable. Ascending current promoted the richness of TOC. The salinity of water did not make a difference to TOC.