Abstract: Shale gas, as a kind of unconventional natural gas, occurring in the reservoir which is mainly composed of organic shale, and the evaluation of organic matter abundance is the basis of the evaluation of shale gas exploration potential. Jiangshan area of western Zhejiang province is almost a blank area for shale gas exploration. Based on logging characteristics, determination of the residual total organic carbon, rock pyrolysis, taking the residual organic carbon content, residual hydrocarbon potential and hydrogen index of source rocks as the main parameters, quantitatively evaluating the total residual organic matter abundance of source rocks in Hetang formation of well ZJD-1, combining organic geochemical characteristics, the types of source rocks, mineral characteristics and microscopic characteristics of outcrop mud shale samples and coresamples of Hetang formation in Jiangshan area of western Zhejiang province, evaluating source rocks comprehensively. The results show that the quaternion regression analysis equation is used to calculate the residual total organic carbon content of source rocks in Hetang formation of well ZJD-1. The correlation coefficient \( R^2=0.7437 \), and the standard error between the calculated value and the measured value is 0.164. Measured residual total organic carbon content and residual cracked hydrocarbon values obtained by pyrolysis experiments have good correlation, the correlation coefficient \( R^2=0.827 \). So, the longitudinal distribution of residual total organic carbon content, residual hydrocarbon generation potential and hydrogen index in Hetang formation of well ZJD-1 was obtained. Source rocks of the Cambrian Hetang formation in Jiangshan area are rich in residual organic carbon but poor in hydrogen organic matter. Outcrop samples shows that hydrocarbon source rock is organic matter type Ⅰ kerogen, most of hydrocarbon source rocks in the high - mature thermal evolution stages. There are few organic pores in mudstone segment of source rocks in well ZJD-1, but microfractures are relatively developed. In addition, through tectonic movements many times, the lower Yangtze area is poor. Therefore, it can be considered that source rocks in the Hetang formation of the study area has a good hydrocarbon generation material basis, but its hydrocarbon generation capacity and preservation conditions are poor.

Keywords: Jiangshan area, logging data of well ZJD-1, multiple regression method, residual total organic matter abundance

About the first author

WANG Xiuqi, female, born in 1992 in Songyuan City, Jilin Province; Doctor; She is now interested in the study of petroleum geology. E-mail: 1106267571@qq.com; phone: 15610071968.

About the corresponding author

ZHANG Xunhua, male, born in 1961 in Zibo City, Shandong Province; Researcher; He is now interested in the study of Marine geological structure and Marine geophysics. Email: xunhuazh611102@sina.com; phone: 18013912796.