Evolution Law of Coal Quality and Coal Facies Controlled by Sequence Stratigraphy of Xishanyao Formation, Eastern Junggar Coal Field, China

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Coal seams formed in different environments have various properties, such as different moisture, ash and volatile yields, and fixed carbon content. By examining such coal proximate analysis index as M_{ad}, A_d, V_{daf} and FC_{ad}, as well as maceral quantitive data as *TPI*, *GI* and *V/I*, we can draw a conclusion that, in this area, different seams formed in different envorionments, and this difference can be explained by a coal evalution law of coal quality and coal facies analysis. Therefore, the purpose of this paper is trying to elucidate the relationship between these coal properties and evolution law using the concept of sequence stratigraphy controlling the depositional process, then, the coal facies. Based on the principle of sequence stratigraphy and coal geochemical analysis, the stratigraphic division of Xishanyao Formation in Xiheishan area is studied through the comprehensive analysis of bore cores and well logging data. As a result, such three systems tracts as low-stand systems tract (LST), lake expanding systems tract (EST) and high-stand systems tract (HST) are recognized, and more para-stratigraphic sets are identified in each systems tract. Besides, braided river delta and lake depositional systems of Xishanyao Formation are deciphered into four subfacies and 8 microfacies under the constraint of sequence stratigraphic framework. Coal proximate analysis and quantitative statistics of macerals are introduced in order to identify the coal facies as moist forest swamp and dry forest swamp. As a result, The evolution law of coal facies is controlled by the variation of lake level which was constrained under the framework of sequence stratigraphy in this area, and the lake level determines the development of peat swamp, and then, forms different accumulating environments.

Key words: maceral; coal facies; proximate analysis