

Oil Families and their Distribution in Zhanhua Sag in East China

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Zhanhua sag is a prolific faulted sub-basin in east China. Three major oil families have been identified based on physical properties, isotopic composition, gas chromatography and mass spectrometry. Distinctive molecular characteristics are effective marker for correlating these oil families to source rocks. Family A oils are found only in Oligocene sandstones and carbonates near depocenter of the sag. This oil family is of low-mature feature and sourced from the Oligocene lacustrine oil shale and mudstone. Family B oils have most important reserves and are found in clastic reservoirs from the Mid-Eocene to Miocene. Not only this family is produced within the sag, but also in peripheral buried hills, thus forming several great oil fields. Marginal faults are main migration pathway for them. Family B oils are mature and originated from Mid-Eocene oil shale and mudstone. Family C oils are found in sandstones in Lower Eocene within the sub-basin. This family is high-mature light oil and sourced from the Lower Eocene mudstone. These source rocks were deposited in diverse lake environments in different stage of the rifting phase in Lower Tertiary and underwent different thermal evolution. Three petroleum systems have been identified in Zhanhua sag and have respective geographic and stratigraphic distribution.