

Geological and Geophysical Characteristics of the Continental Margin Basins of China and Adjacent Region

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The southeastern margin of the Eurasian continent is situated along the inner side of the western Pacific Ocean super-subduction belt and island arcs. Cenozoic sediments cover almost all the offshore area. Because of the great potential of oil and gas resources, many geophysical and geological investigations have been carried out during the past 40 years. Andesite and rhyolite dominate the volcanic rock series developed along the mainland margin and continental shelf, implying an active continental margin in the Late Mesozoic.

The China continental margin areas were under an extensional regime during Paleogene. The marginal basins are characterized by multi-episodic rifting and the major hydrocarbon source rocks were formed in this period. At the Neogene post-rifting stage, several drape-like depressions filled with marine sediments.

Based upon deep geophysics, petrochemistry and modeling studies, it has been verified that the crust and lithosphere beneath the continental margin have been stretched and thinned. The Moho discontinuity is commonly at a depth of 18 - 25 km, and underplating has been found in the deep part of the crust. Mantle upwelling is fairly conspicuous beneath the East China Sea and South China Sea basins. It is assumed that the upward mantle flow may be the major controlling factor for the formation of the rifted continental margin during the Cenozoic; the existing high heat flow and overpressure systems are attributable to this process.

Arc-continent collision occurred during Pliocene times, and is an important controlling factor for hydrocarbon accumulation.