

The Distribution Features and its Geological Significance of CO₂ : Evidence of the South China Sea

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There are some basins named Pearl River Mouth Basin, Ying-Qiong Basin, Meikong Basin (Cuu Long Basin), Wan'an Basin (Nam Con Son Basin) and Natuna-Sarawak Basin in the western South China Sea (SCS). Much abundant amount of CO₂ (e.g, DF1-1, AL, and LD Gas-bearing areas) is bored in these basins. The gases have been divided into three genetic groups, named biogenic gas, thermogenic, and gases with mixed origin, according to gas isotopic geochemistry (Huang et al., 2004). Combined Pyrolysis experiments on Tertiary calcareous shales from Ying-Qiong Basin and analyzing the distribution rules of CO₂ collected from some gas fields exploration data, we suggest that the calcareous shales occurring in the lower Miocene strata are the main source of inorganic CO₂ gas, and that the formation of inorganic CO₂-gas is related to the decomposition of the calcareous shales experienced abnormally high geothermal gradients and rapid subsidence. The reactions are summarized as follow: siderite + quartz + kaolinite = chlorite + CO₂, calcite + kaolinite + quartz = laumontite + CO₂. The CO₂-rich gases in the SCS may be a part of the CO₂ -bearing gas belt in the east China (Dai et al., 1996) extension toward the SCS (Liu et al., 2004a). The gas belt is related to the diapiric structures forming by lithosphere thinned in the east China and the deep Red River fault system (Liu et al., 2004b). Furthermore, The authors have established the dynamics models of CO₂-rich gases derived the different tectonic environment.

Keywords: Gas Distribution of CO₂-bearing; Dynamics Model; South China Sea

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