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Lithological and Petrographic Analyses of Carbonates and Sandstones From the Southern Gulf of Mexico

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We present results of sedimentological and petrological studies of drill cores from the Bay of Campeche in the southern Gulf of Mexico. Based on reports on drill cores obtained from oil exploratory wells in the Cantarell Complex located 80 kilometres offshore in the Bay of Campeche and studies related to regional geology composite simplified stratigraphic columns for offshore Campeche region have been constructed up to depths of approximately 5000 m. The stratigraphic column is formed by a thick sediment sequence of Middle Jurassic age (evaporites, Callovian), Late Jurassic (terrigenous, calcareous clays and calcareous layers), Lower Cretaceous (carbonates), Upper Cretaceous-Paleogene (calcareous breccias), Paleogene-Neogene (terrigenous-carbonates intercalations) and Quaternary (terrigenous). The core samples studied come from wells in the Sihil and Akal fields in Cantarell. Analysis of reports on lithological descriptions indicates that these wells sample dolomitized sedimentary breccias from the Upper Cretaceous-Paleocene and fine-grained sandstones from the Late Jurassic Tithonian, respectively. Based on results of petrographic studies, the texture, cementing material and porosity of the units have been documented. The thin sections for carbonates were classified based on their texture according to Dunham (1962) for carbonate rocks, classified according to their components using the ternary diagrams of Folk (1974). Percentages refer to the data presented in tables, which were obtained by point-counting technique (with a total 250). Photomicrographs of scanning electron microscope (SEM) provide magnification for easy documentation of crystalline arrangements and description of micro-porous for different types of carbonates such as dolomite, in addition to the morphology of authigenic clays. Results of these studies and previous works in the area permit characterization of diagenetic processes of the carbonate sediments in the Campeche Bay, and provide information related to oil maturation, storage and potential flow in the Cantarell reservoirs.