Mesozoic Structural Architecture of the Middle Indus Basin, Pakistan – Controls and Implications

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Abstract

Mesozoic structural architecture of the Middle Indus Basin is largely controlled by the rift/drift plate tectonic events occurring throughout this time. Several different tectonic pulses during the Mesozoic that dominated this basin at the leading edge of the Indian Plate are registered in the sedimentary record. Presence of the thick carbonate platform sediments of the Chiltan Formation throughout the study area, points to the tectonic quiescence during its deposition and hence, provides the necessary stratigraphic datum to investigate the overlying younger sedimentary strata.

The sedimentary succession overlying the Jurassic Chiltan carbonate platform shows signs of multiple phases of extensional and strike-slip deformation. Current the study focuses on delineating various stress episodes responsible for the creation of tectonically induced subsidence of the Middle Indus Basin, during the Mesozoic. In the process, the fault dating is carried out by recognizing different kinematic indicators, related to fault movement in an attempt to assign ages to different tectonic pulses. Focus has been laid upon the chronological analysis of the fault behavior in the area and appreciating the significance of the older structural fabric in shaping the progressively younger sedimentary record. Finally, a synthesis of the local tectonic events that created and shaped the structural styles in the Middle Indus Basin, during the Mesozoic, is presented in a regional geological context and its bearing on the HC accumulation, is discussed.