[PE09]

INORGANIC GEOCHEMISTRY A TOOL OF SEDIMENTARY BASIN ANALYSIS – CONCEPTS, MODELS, AND IDEAS

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Sandstone analysis in outcrops of actual production and exploration areas of siliciclastic systems, is becoming of major interest in basin analysis in Mexico. Analogues of outcrops to existing production and exploration areas help to optimize exploration and development. The present study shows the application of classical petrography and inorganic geochemistry (Mayor-, Trace-, and Rare Earth Elements) in the comparison of following two study areas:

(1) The *Paleogene Chicontepec system* is located as a play in the Tampico-Misantla Basin being part of the petroleum bearing basins in the Western Gulf of Mexico. During the Paleocene to Eocene turbidity sequences were deposited in the Sierra Madre foreland, eroding a paleo channel system between the Sierra Madre Oriental in the west and the Tuxpan Platform in the east, receiving its sediments from the mainly carbonate rocks of the Sierra Madre Oriental.

(2) The *Sierra de Chiapas*, situated in the southeastern Mexican Republic. Surrounding geological elements are the Chiapas Massif in the south, the Yucatan carbonate platform in the east, and the Chiapas-Tabasco basin in the north, being also part of the petroleum bearing basins in the Western Gulf of Mexico. Sediments transported in turbidity systems were deposited during the Paleocene to the Lower Miocene. Miocene deposits are comparable to the oil bearing sandstones of the "Salina del Istmo" basin.

In relation to the "classical" techniques of sedimentary petrography, the analysis of inorganic geochemistry is somewhat hidden in the tools of sedimentary petrology. The fact is (however) that the quality of the "raw" data of sedimentary petrography generated by the experience of the researcher is already influenced by a first form of interpretation. Geochemical analysis, meanwhile allow the generation of raw data with high quantity or sample density without significant variations in quality to form a perfect complementary or independent tool of sandstone petrology. Compared to igneous rocks, sediments are not generated in a chemical equilibrium of a defined magma. The composition of siliciclastic rocks is defined by the mineralogical composition, the type of source rock; geotectonic environment, facies, climate and, finally of diagenesis. These processes overlap each other and difficult the interpretation of the geochemical data. However, the case studies show that a discrimination of these influences is possible.