

## Abstract

Petrographic and geochemical analysis of the Hamra Quartzite reservoir in the southern periphery of the Hassi Messaoud field has been undertaken. The aim is to identify the quality of these sandstones as well as their tectonic setting and possible provenance. Petrographic analysis reveals that the studied reservoir is constituted of fine- to coarse-grained sandstones in which quartz forms the principal framework mineral. The main cement phases identified in this reservoir are quartz, illite, and carbonate, precipitated in that order. The principal diagenetic factors controlling the reservoir quality are quartz overgrowths, formation of authigenic clays, and the precipitation of carbonate cement. The Hamra Quartzite reservoir is considered mature from a compositional point of view as it consists predominantly of quartz arenites. Geochemically, these sandstones have a high SiO<sub>2</sub> content (93.28-98.79 wt%). The Hamra Quartzite deposits appear to be derived from deeply weathered (under warm-humid climate conditions) granitic-gneissic terrains or recycled sedimentary source areas. A passive margin origin is the most likely tectonic setting for the depositional environment of these arenites. The reservoir quality is strongly influenced by the relationship between the clay content and mineralogy. The combined effect of quartz overgrowth and the plugging of pores by illite have reduced both porosity and permeability. As a result, economically viable oil production in this area will depend most strongly on the combination of matrix and fracture porosity