The Role of Skeletal Microstructure During Selective Silicification in Foraminiferal Components of the Eocene Hybrid Limestones, Amoreh – Qum, Central Iran

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The study is focused on the Eocene hybrid limestones locate in the Amoreh-Qum area, central Iran. This hybrid limestones show silicification as a major diagenetic process. Three type of diagenetic silica are distinguished; Megaquartz, Microquartz and Chalcedony. The generalized pathway of silicification is: Opal-A (siliceous biogenetic ooze) → Opal-A′ (secondary amorphous silica) → Opal-CT → reordered Opal-CT → cryptocrystalline quartz → chalcedony → microcrystalline quartz. The diagenetic transformation occurred by solution-reprecipitation and silica development both as void filling cement and replacement after calcite, the latter which is partly fabric selective can be testified by existence of calcite inclusions within chalcedony or Megaquartz. Silicification of the Amoreh area is interpreted to be late diagenetic, in which silicification occurred when completely lithified carbonate rocks reached the burial environment. Non-skeletal factors controlling silicification include in: concentration of silica in the solution, rate of silica nuclear growth, permeability of matrix and precipitation rate of silica. Selective silicification in bioclasts was controlled by thickness, mineralogy, concentration of organic matters, microporosity and microstructure of the foraminiferal tests. The major replacement takes place in Nummulites and Assilina in which calcite are replaced with microcrystalline quartz and length–fast chalcedony. In most samples, replaced microcrystalline quartz reveals the trend and orientation of homogenous prismatic or normal prismatic microstructure of Nummulites and Assilina. Whereas, the silicification rarely occurs in Discocyclina and Operculina. On the other hand, this process has not been developed in Amphistegina, Alveolina, Miliolid, Pellatispira, Borelis and Peneroplis. The probable source of silica were biogenic and volcanoclastic particles.

Key words: *Selective Silicification, hybrid limestones, Amoreh, Qum, Central Iran*