

# **Silicification in Carbonate and Phosphate Host sediments: Cretaceous/Eocene of Egypt**

**EL-SHISHTAWY, A.M.**

Geology Department, Faculty of Science, Tanta University, Tanta, Egypt

Chert associated with calcareous sediments (including calcareous-siliceous and siliceous calcareous sediments), chalks, dolostones and phosphorites, is the most common form of silica in the Egyptian rocks. Examples include the Lower Cretaceous and the Lower Eocene rocks in southern, eastern and central Egypt and in central and northern Sinai. The silica within these lithotypes may form beds or nodules of chert and porcelanite. The presence of poorly preserved ghosts of siliceous microfossils in these rocks favors a biogenic origin for the silica. Chert replaces, and in some cases, displaces, existing carbonate minerals, usually preserving original textures and structures.

Chert formation appears to have occurred during at least two stages of silicification. The first stage probably occurred in calcareous-host rocks during relatively sea level highs where dissolution of biogenic opal and mixing of marine and fresh waters have produced pore waters highly supersaturated with respect to quartz and undersaturated with respect to calcite. With continuous mixing, silica concentration can rise until saturation values are attained; the net result is, therefore, the precipitation of silica as nodules and beds of chert. The next diagenetic stage, which is probably a normal marine to evaporitic stage, probably occurred during relatively sea level lows, and involved reworking of phosphatic sediments formed during the first stage resulting in a residual deposit enriched in apatite. Nodular quartz cherts and porcelanites are typical for the carbonate environment and originated by localized silica concentration in fossil cavities.