



Authigenic dolomite cementation in the Upper Cretaceous Phosphate Formation, Western Desert, Egypt.

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The Upper Cretaceous Phosphate Formation in the Western Desert of Egypt displays a characteristic facies association that includes marine phosphorites interbedded with black shales and glauconitic sandstones. Primary intergranular pores within marine phosphorites are partly filled with disordered and non stoichiometric (Av. $\text{MgCO}_3 = 42$ mole%) authigenic dolomite cement. SEM and the back scattered images of these coarse crystalline dolomite cements reveal that they display planar euhedral crystal boundaries, polymodal crystal size distribution and variable inclusion pattern. The relatively low and wide ranged $\delta^{18}\text{O}$ (-0.87 to -4.15‰, VPDB) values of the dolomite cements coupled with their depleted Sr (Av.=212 ppm) and high iron (Av.= 6967 ppm) and manganese (Av.= 1855 ppm) values invoke that they were formed from mixed hypo-saline fluids nearby or within a mixing marine-meteoric zone probably during a low stand period at the vicinity of the Maastrichtian/Early Tertiary unconformity. Meanwhile, their negative $\delta^{13}\text{C}$ (-1.31 to -3.56‰, VPDB) values argue for a possible involvement of isotopically light carbon, derived from degradation of organic matter, during their precipitation.