

*Palaeokarst facies analysis:
General trends and Cretaceous occurrences
(Resumen)*

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Karst facies are described as part of an ideal profile: surface karst, percolation, oscillation and saturation zones. The development of karst facies is controlled by the previous permeability network and it is useful to consider qualitative stages of evolution (juvenile, mature, senile) for each of the karst facies or for the entire profile. This may be characterized by the amount of porosity obliteration (sedimentation, cementation) versus porosity enhancement (corrosion, corrasion). The basic geometric styles of karst facies and their corresponding reservoirs are: blankets, linear trends, mosaics, wedges and multi-layered. The recharge area and the hydraulic head, together with the evolution of the local base levels are key factors involved in evaluating the potential size and trends of the karst basins. Karst facies associations can be grouped in major complexes or facies associations: coastal, mountain, plateau, depositional (syngenetic), submarine, confined (artesian) and hydrothermal.

All the different karst facies and facies associations can be grouped in three major types of karst according to the magnitude of the stratigraphic gap involved (exposure time): (i) single unconformity karst (3rd order sequence boundary), (ii) multiple unconformity karst (1st-2nd order supersequence boundaries), (iii) subsequence karst (4th-6th order sequence boundary). The influence of depositional facies patterns and eustatic control in karst development is predominant in (iii); tectonic control and associated fracture networks are commonly involved in (ii); combinations of both types of control can be present

in (i). There is a strong cyclicity (climatic, relative sea-level and base-level oscillations, tectonic cycles) affecting in different orders of magnitude the development of karst fabrics, facies and profiles. Rock fabrics show two distinctive patterns of facies overprints: towards shallower karst facies during regional uplifts, and towards deeper karst facies during burial.

Hydrocarbons and bauxites are two of the most important mineralizations that can be found in karst facies. The analysis of 254 case histories reveal that hydrocarbons occur in all the different types of karst facies and facies associations, and show a mutually exclusive relationship with the bauxite occurrences. Major bauxite accumulations are predominant in shallow karst facies in advanced stages of evolution in tropical, coastal, mountain, plateau karst environments, in relation to multiple and single unconformities.

The Cretaceous shows a wide variety of global karst events and facies associations. Examples of the Early Valanginian, Turonian and Maastrichtian composite karst and the Early Aptian, Late Albian and Mid Cenomanian single unconformity karst are presented as contributing to a very large amount of the global production of hydrocarbons and bauxites.