Microbial transformations of deep hydrocarbon-water flows

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The distribution of oils with depth obeys a certain regularity. Most deep-seated oils and gas contain a very small amount of isoprenoid biomarkers (Fig1., Fragment A^0 and A^1). These oils can contain only micro amounts of biomarkers taken from scattered organic matter and the original set of pseudobiomarkers similar to those discovered in carbonaceous meteorites. Major components of such oils are n-alkanes. Optical activity in the oils of this kind is not manifested.

Less deep-seated oils (Fig. 1., Fragment A^2) with significant amount of chain isoprenoids of the type of phytane, pristane and their homologs are generated with deposits forming in rock mass in the presence of archaebacteria consuming geofluid as substratum and in this case the temperature in which they develop may be more than 100°C. As a result, chain isoprenoids of the membranes of those bacteria find themselves in the oil. It is essential that the above-mentioned biomarkers formation is simultaneous with the formation of oil deposits and is not their further transformation after the genesis.

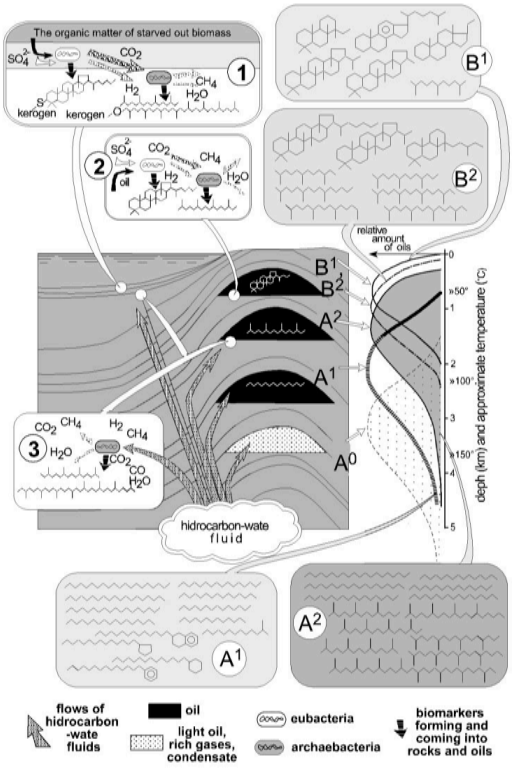

Figure 1: The distribution of prevailing biomarkers in the oil of various types and mechanisms of enriching oils with isoprenoid biomarkers, which synthesize by archaebacteria and eubacteria

Cathodoluminescence characteristics of various Sphalerite ores from Turkey

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Cathodoluminescence microscopy (CLM) can provide very useful information on mineral zoning formed during crystal growth and variations in chemical composition of certain minerals. Sphalerite ores associated with the major volcanogenic massive sulfide deposits (VMS), large variety of vein type mineralizations, skarn mineralizations occuring in Eastern Pontide Tectonic Belt (EPTB) have been studied by the CLM and electron probe microanalysis (EPMA) to determine the relationship between trace element activators, their contents and the CL properties. Sphalerites from most of the VMS deposits show a range of CL colors (yellow to purple) with varying intensity due to Mn, Cd, Cu, and Ag contents. Sphalerites from Pb-Zn dominant vein type occurrences do not cathodoluminescence due most probably to common CL-quencher, Fe^{2+} content. However, sphalerites from epi-mesothermal mineralizations give strong CL due to various CL-activators (Ag, Hg, Cd, Cu, and Mn). On the other hand, sphalerites from contact metasomatic type mineralizations do not produce CL, although some of the sphalerites did contain very low Fe^{2+}. They most probably had very low CL-activators in their crystal structures. Based on the available data, by using the CLM technique, sphalerites could be used for fast identification of unknown ores for type speciation.