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## Thermobaric characteristics of fluid inclusions in subsalt sediments of east part of Precaspian basin

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The fluid inclusions in calcite and quartz of Carboniferous and Permian series of East part of Precaspian sineclise were studied. By the microthermometry method melting and homogenization temperatures of fluids in crystals, were determined. Despite the low abundance in fluid inclusions of the samples studied, two main aqueous types of inclusions were observed: monophasic and biphasic. The monophasic (Mw) inclusions are particularly observed in the Permian series and many more exceptionally in Carboniferous series. The biphasic aqueous inclusions (Lw) were sporadically observed in Carboniferous samples (Viseen series) and systematically in the Devonian.

For biphasic inclusions, the salinities range from 2-15% NaCl equivalent weight, and a great variability of Th (very low to much higher, 150°C). One group of biphasic fluid inclusions has very low homogenization temperatures (about 65°C). The second group of fluid inclusions has the average homogenization temperatures of 115°C.

The intersection of the isochoric '115°C' at the Pressure-Temperature diagram with the hydrostatic gradient of 30°C/km (average determined for considered region) gives a P-T couples - 350 bars, 130°C. In this case the thermal gradient in lithostatic regime is rejected because the intersections are obtained for unrealistic pressures.

The isochoric '65°C' corresponds to sample with depth 5600 m. The interpretation in terms of couple (P, T) is delicate; two major assumptions can be made:

1. The fluids were trapped early before burying currently observed.

- In this case, the intersection of the isochoric with the hydrostatic gradient (30°C) leads to the following estimates of pressure and temperature: 180 bars, 70°C;

- The intersection with the lithostatic gradient (30°C/km) corresponds to values P, T 500 bars and 85°C. The high pressure could then explain the high density anomalies hydrocarbon inclusions (leakage by deformation of the calcite). Lithostatic pressure of 500 bars correspond to a minimum depth of about 2,2 km.

2. The fluids were trapped at depths equivalent to the current depth. In this case the intersection of thermal gradients in hydrostatic and lithostatic regimes with isochoric of aqueous inclusions (Th = 65°C) to a depth of trapping of fluids equivalent to the current depth follow to the next interpretation. The two pairs of extremes values (P,T) are then as follows: 90°C, 560 bars, which corresponds to a hydrostatic gradient of 12°C/km and 120°C, 1300 bars corresponding to a lithostatic gradient 20°C/km.

Conclusion.

- The presence of many single phase aqueous inclusions and very low homogenization temperatures (65°C) indicate low temperature trapping conditions, consistent with the low degree of maturation of the organic matter (VR <0.8).
- The interpretation of results of measurements has allowed defining most typical values of pressure and temperature equal, accordingly, 300-500 atm and 80°-130°C. Mineralization of water inclusions corresponds 10-12 % of NaCl weight equivalents.
- All data involves diagenesis conditions of relatively original basin characterized by relatively low temperatures, but also by very probable heterogeneities in the temperature distribution.

