



## **Duration of the hydrocarbon fluid formation under thermobaric conditions of the Earth's upper mantle**

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Deep abiogenic formation of hydrocarbons is an inherent part of the Earth's global carbon cycle. It was experimentally confirmed that natural gas could be formed from inorganic carbon and hydrogen containing minerals at pressure and temperature corresponding to the Earth's upper mantle conditions.

Reaction between calcite, wustite and water in the large volume device was studied in several works. It was previously proposed that reaction is possible only after 40 minutes of exposure at high pressure and temperature. In this work similar experiment at  $P = 60$  kbar and  $T = 1200$  K were carried out in "Toroid" type chamber with the 5 seconds duration of thermobaric exposure.

Gas chromatographic analysis of the reaction products has shown the presence of hydrocarbon mixture comparable to 5 minutes and 6 hours exposure experiments. Based on this fact it is possible to conclude that the reaction of natural gas formation is instant at least at given thermobaric conditions. This experiment will help to better understand the process of deep hydrocarbon generation, particularly its kinetics.