COMPOSITION OF PYROLYSIS GAS FROM OIL SHALE AT VARIOUS STAGES OF HEATING

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Underground pyrolytic conversion of oil shale may become an alternative source of fuel gas and synthetic oil. The main scientific problem in designing of this technology is to provide a methodology for determination of the optimal mode of heating a subterranean formation. Such a methodology must allow predicting the composition of the pyrolysis products and energy consumption at a given heating rate. The experimental study of heating of oil shale sample was carried out. The goal was to define the dynamic of sample heating and pyrolysis products composition. Sample of the rock was heated in conditions similar to the underground during 19 hours. The electrodes were made from graphite and spaced in 250 mm. The temperature was measured in 4 points. The first point was located in the center between electrodes. The second, third and fourth points was removed from the axis between the electrodes at 30 mm, 60 mm and 90 mm, respectively. The chamber with the sample was evacuated and then filled with nitrogen to a pressure of 5 kgf/cm^2. In the experiment, the temperature in the center of the heated zone reached more than 900 °C at the time when the temperature in fourth point was less than 100 °C. That is the evidence of low thermal conductivity of oil shale. During the heating the content of the hydrogen and carbon oxides in the pyrolysis gas is increased, and the content of methane and other hydrocarbons is reduced. The combustion heat of gas is reduced.

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