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OXIDATION OF METHANE UNDER ADIABATIC COMPRESSION CONDITIONS

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P. 597 In the studies made by M. V. Polyakov /1/, A. A. Koval'skii /2/, etc., carried out at pressures not exceeding atmospheric pressure, it was established that a number of chain processes go by a heterogeneous-homogeneous mechanism.

In the literature the widespread opinion exists that at high pressures the effect of the walls on the chain reaction is slight. By running the process under adiabatic compression conditions, where the temperature of the gas mixture is sharply different from the temperature of the walls of the apparatus, it becomes possible to establish the effect of the "cold" wall on the progress of the chain reaction.

Taking as the subject of study a methane-oxygen mixture (for which one of us had previously established /3/ that the oxidation reaction takes place even at a pressure of 200 - 300 at [technical atmosphere = 735.5 mm of Hg] and a wall temperature of 400°, and ~~going~~ goes instantaneously at 500 - 600°), we studied this mixture in the adiabatic compression apparatus designed by Yu. N. Ryabinin /4, 5/. When filling the barrel of the apparatus the barrel and all of feed lines were evacuated well with a vacuum-pump, and then filled with the methane-oxygen mixture at a pressure exceeding atmospheric.