

# Experimental studies of methane–air mixtures ignition in a shock tube

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Experimental ignition delay times of methane–air mixture ( $\phi = 0.5$ ) were obtained in a wide range of parameters behind incident and reflected shock waves.

This work was carried out on a double-diaphragm round shock tube with diameter of 45 mm, 0.7 m length of high-pressure chamber and low-pressure chamber of 3.2 m long that was described in [1]. The heated temperature was varied from 900 to 2300 K, pressure range was from 10 to 200 atm. Photo-multipliers were utilized to record the ignition of the combustible mixture. To measure Mach number of the shock waves and time reference of ignition delay time, pressure transducers were installed in the walls of shock tube.

To obtain the effect of turbulence in the ignition delay time, a mesh consisting of four wires with a diameter of 2 mm each was installed in the cross section of the shock tube. Decreasing in ignition delay time of combustible mixture passing through such a grid has been observed.

- [1] Zhukov V P, Sechenov V A and Starikovskiy A Yu 2003 *Combust., Explos. Shock Waves (Engl. Transl.)* **39** 487–495