# ARAS study of the interaction of tetrahydrofuran with oxygen behind shock waves

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Tetrahydrofuran ($C_4H_8O$) is promising applicant for the complete replacement of gasoline fuel. Several scientific groups are conducting research on the development of the chemical-kinetic mechanism of combustion of this biofuel, but it still needs significant improvements. The main goal of this work is the experimental study the interaction of tetrahydrofuran with oxygen at the high temperatures 1650-4150 K and pressures 1.6-2.8 bar. The kinetics of reaction of tetrahydrofuran molecules with oxygen in mixture 10 ppm $O_2$ + 10 ppm $C_4H_8O$ in argon behind reflected shock waves is studied. The quantitative measurements of the time profiles of the concentration of oxygen atoms in the ground electronic state $O(^3P)$ were carried out by the precise method of atomic resonance absorption spectroscopy (ARAS) on the resonant vacuum-UV line of an oxygen atom at 130.5 nm. Along with the experimental measurements, a detailed kinetic analysis was carried out using the Chemkin code, with a simulation of oxidation processes using current kinetic mechanisms and a corresponding sensitivity analysis of considered reactions. The data obtained in the course of a comprehensive study provide new valuable information on the features of the interaction of tetrahydrofuran with oxygen at high temperatures, which will help both in verifying existing mechanisms and in creating new reliable kinetic schemes in a wide range of temperatures and pressures.
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