Supplementary materials for the paper
"Numerical study of the influence of the photochemical activation of oxygen molecules on HCCI performance"
A.M. Starik, V.E. Kozlov, N.S. Titova

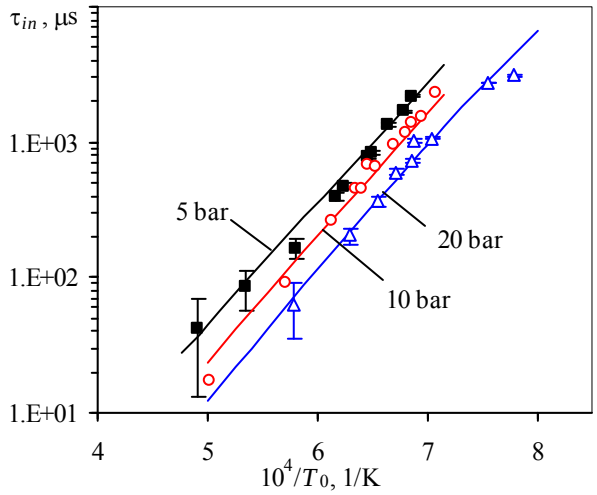

Figure S1. Induction delay time τ_{in} as a function of initial temperature T_0 in the mixture $CH_4/O_2/Ar$ at ϕ=0.5 and P_0=5, 10 and 20 bar. Symbols are experimental data [1] (the value of the experimental uncertainty in ignition delay is depicted by vertical error bars), curves are calculation results.

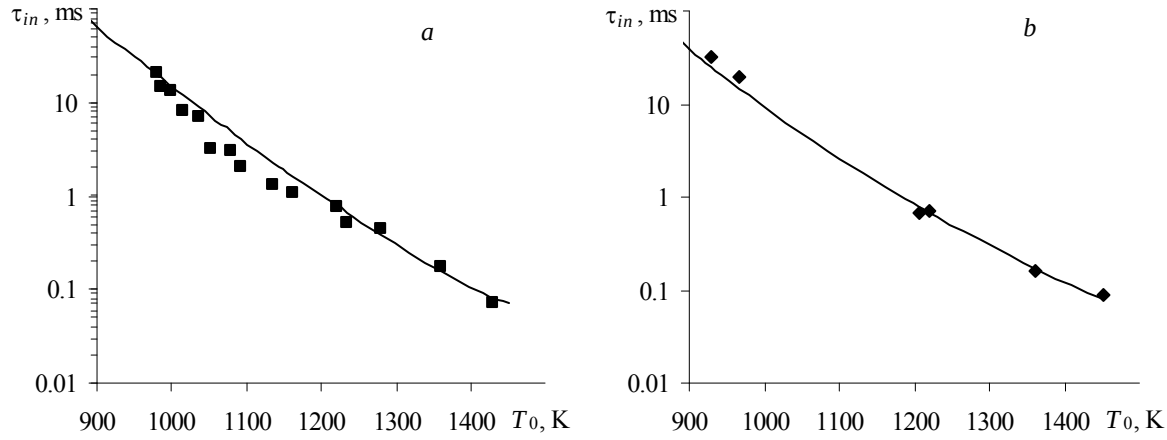

Figure S2. Ignition delay time τ_{in} as a function of initial temperature T_0 during the CH_4-C_2H_6-C_3H_8 = 90/6.6/3.3 mixture oxidation in air at ϕ=0.5 (a) and 1 (b), P_0=30 atm. Symbols are experimental data [2], curves are calculation results.

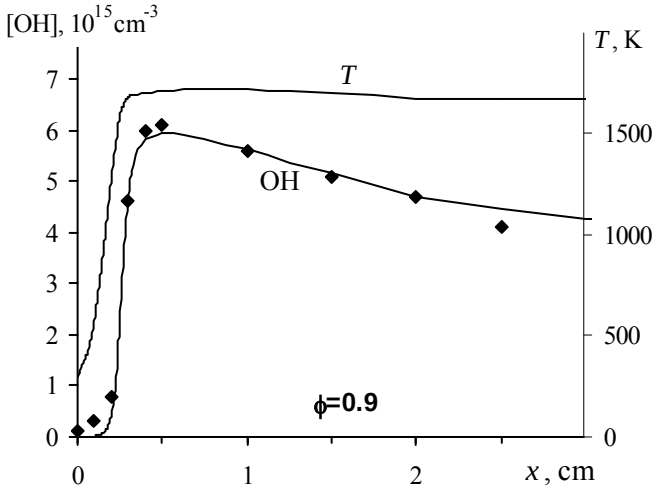

Figure S3. Calculated and measured [3] spatial profiles of OH mole fraction in the CH_4-air laminar flame at T_0=300 K, P=125 torr and ϕ=0.9.

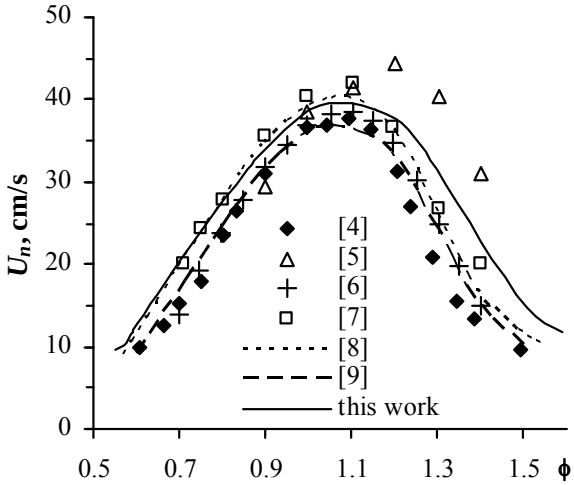

Figure S4. Predicted (lines) and measured (symbols) values of flame speed U_n as a function of ϕ for CH_4-air mixture at P_0=1 atm and T_0=300 K.

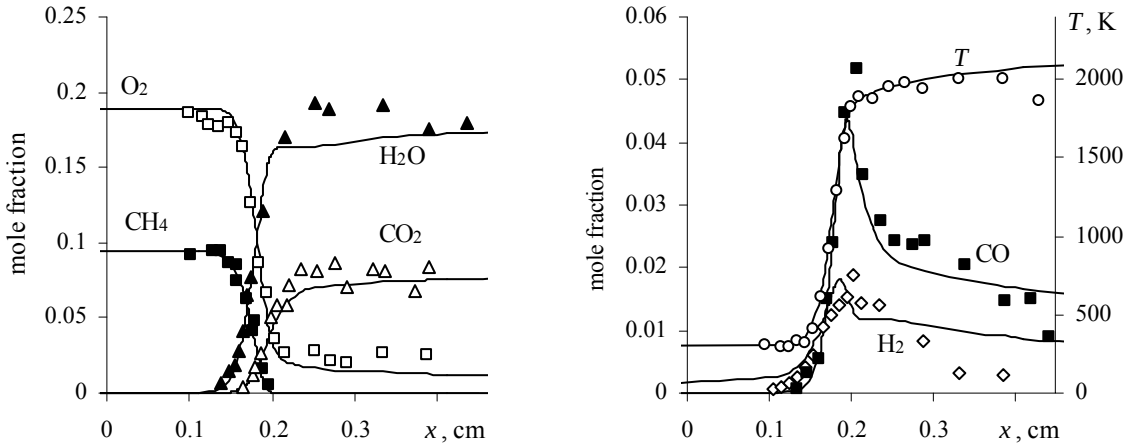

Figure S5. Spatial profiles of O_2, CH_4, H_2O, CO_2 as well as CO, H_2 species mole fractions and temperature in the flame front for CH_4-air mixture with ϕ=1. Symbols are experimental data [10]; lines are calculation results.

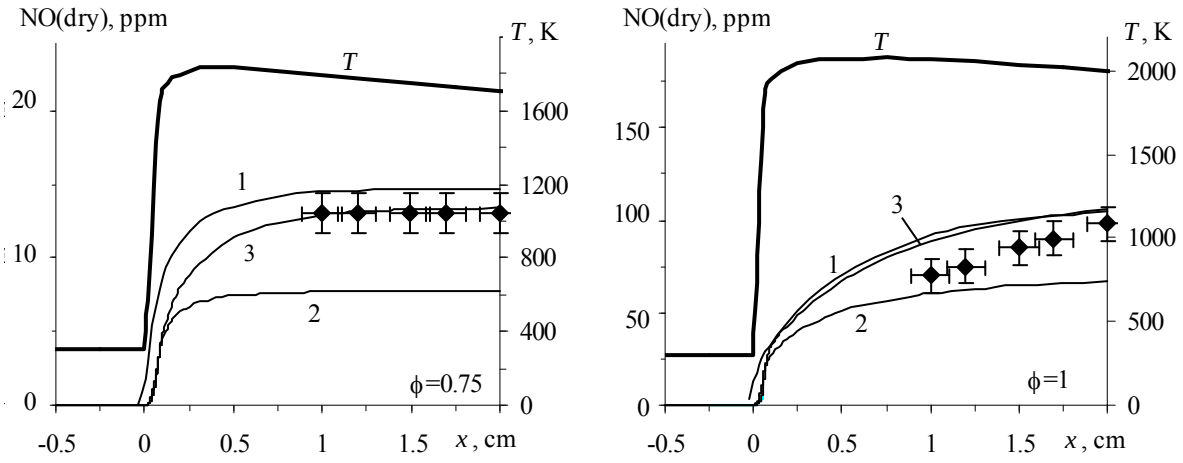

Figure S6. Calculated and measured spatial profiles of NO concentration in the atmospheric CH_4-air flame with heat losses and corresponding temperature profiles for ϕ=0.75 and 1. Points are experimental data [11]; lines are the predictions of different kinetic models: 1 – [9], 2 – [8], 3 – this work.

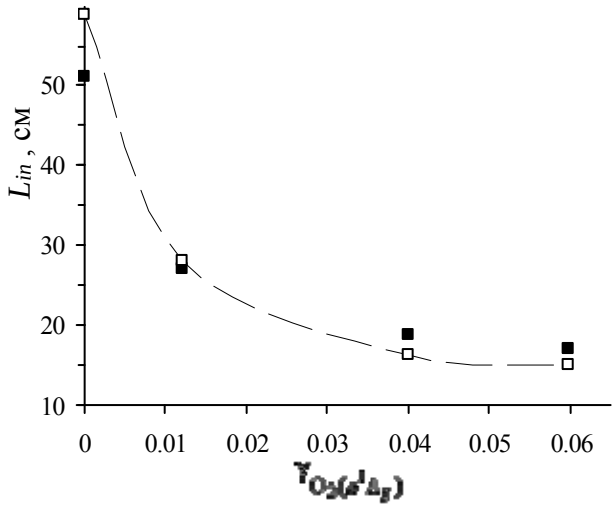

Figure S7. The dependence of the ignition delay length L_{in} on the mole fraction of the $O_2(a^1\Delta_g)$ molecules in the total molecular oxygen in the H_2/O_2=5/2 mixture at the pressure P_0=10 Torr and flow velocity u_0=17 m/s. Filled points are the experimental data [12], line is the calculation results.

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