

ON THE REACTIVITY OF SINGLET DELTA OXYGEN WITH RESPECT TO THE SIMPLEST HYDROCARBONS

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Abstract: The data available today in the literature on the kinetics of chain initiation reactions involving electronically excited singlet delta oxygen $O_2(a^1\Delta_g)$ and molecules of the simplest hydrocarbons (CH_4 , C_2H_6 , C_2H_4 , and C_2H_2) have been analyzed. Based on the literature data and theoretical estimates carried out, the most probable reaction products have been identified for all the considered processes, and the corresponding Arrhenius approximations of the rate constants have been recommended with the aim of including them into the detailed kinetic mechanisms describing the effect of a nonequilibrium discharge plasma on combustion.

Keywords: singlet oxygen; simplest hydrocarbons; reaction kinetics; plasma-assisted combustion

DOI: 10.30826/CE19120101

Acknowledgments

This work was supported by the Russian Foundation for Basic Research (projects Nos. 17-01-00810 and 17-08-01423).

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Received January 14, 2019

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