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Gas-phase ignition of a condensed substance by immovable local energy source

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Abstract

Gas-phase ignition of a liquid condensed substance by immovable fine wire was numerically investigated. Physicochemical processes with transition were taken into account (heat conductivity, diffusion, convection, mixing, evaporation, oxidation). Ignition regimes and characteristics of steam-gas mixture were determined on the assumption of local heating. Ignition delay time was determined from initial temperature and sizes of a fine wire, distance between energy source and condensed substance surface, initial air temperature and humidity.