

Special Issue on
**Chemistry in Combustion Science and Technology: From
Molecules to Practices**

CALL FOR PAPERS

Combustion is a ubiquitous phenomenon that provides over 80% of the world's energy supply through power generation, industrial heating, and transportation systems, such as boilers, furnaces, stoves, gas turbines, and automotive engines. In addition to these traditional energy conversion sectors, combustion has also become the key process of newly developed multidisciplinary technologies, such as mesoscale-combustion thermophotovoltaic (TPV) system, catalytic combustion, material synthesis, and biomass thermochemical conversion.

The phenomenon of combustion generally includes the processes of chemical reaction, flow mechanics, and heat-mass transfer; and the chemical reaction is regarded as the “heart” among these. Currently, the main challenge in the field of combustion is to enhance fuel conversion efficiency whilst mitigating the environmental impact. To achieve these goals for various applications, an in-depth understanding of the fuel chemistry, especially its reaction kinetics, is of crucial importance. Additionally, fundamental data should be collected for the aim of verifying the proposed reaction mechanisms and pathways. Accordingly, solutions to achieve cleaner and efficient usage of fuel could be expected for industrial applications. Combustion can also lead to problems for combustors, such as corrosion and slagging, the likelihood, and rate of which depends heavily on the fuel properties and its chemical conversion during combustion.

The primary aim of this special issue is to attract the submission of high-quality original research papers and review articles, which will report both the fundamental and practical aspects related to fuel chemistry in combustion process. Works dealing with molecular reactions, multiphase reactions, or even industrial-scale reactors are all welcome. Papers involving comprehensive analysis of the chemical reaction kinetics of fuel will be of particular interest.

Potential topics include but are not limited to the following:

- Density Functional Theory (DFT) calculations and analysis of molecular reactions in combustion-related circumstances
- The development of homogeneous and heterogeneous kinetic reaction mechanisms and their validation and reduction in combustion-related circumstances
- Fuel thermochemical conversion, reforming, or catalytic oxidation and/or reduction
- Pollutants' (NO_x, SO_x, and trace elements) formation and mitigation from combustion processes
- Combustion-related chemical side effects, such as corrosion, slagging, and soot deposition, analysis, and solutions

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/jchem/organic.chemistry/ccstf/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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