DESCRIPTION

The Chemical Engineering Journal focuses upon five aspects of chemical engineering: catalysis, chemical reaction engineering, environmental chemical engineering, green and sustainable science and engineering, and novel materials.

The Chemical Engineering Journal is an international research journal and invites contributions of original and novel fundamental research. The journal aims to provide an international forum for the presentation of original fundamental research, interpretative reviews and discussion of new developments in chemical engineering. Papers which describe novel theory and its application to practice are welcome, as are those which illustrate the transfer of techniques from other disciplines. Reports of carefully executed experimental work, which is soundly interpreted are also welcome. The overall focus is on original and rigorous research results that have generic significance.

Within the Chemical Engineering Journal, the Catalysis section presents Experimental and Theoretical studies in the fields of heterogeneous catalysis, molecular catalysis, and biocatalysis with industrial impact on chemicals, energy, materials, foods, healthcare, and environmental protection.

Within the Chemical Engineering Journal, the Environmental Chemical Engineering section presents papers dealing with emerging topics in environmental chemical and process engineering, including pollution control, separation processes, advanced oxidation processes, adsorption of contaminants, resources recovery, waste-to-energy, environmental nanotechnology and bioprocesses, CO2 capture and utilization, and micro(nano) plastic detection and remediation.

Within the Chemical Engineering Journal, the Chemical Reaction Engineering section presents papers on a wide range of topics including reaction kinetics, simulation and optimization of different types of reactors, unsteady-state reactors, multiphase reactors, and process intensification including fundamental investigations of the processes of heat, mass and momentum transfer that take place along with chemical reactions. Innovative research works addressing critical areas of reactor engineering (e.g. novel reactor designs and materials, reactor safety and environmental issues), and emerging reactor technologies (e.g. membrane reactors, chromatographic reactors, unconventional fluidized bed reactors, electrochemical reactors, micro-reactors, photoreactors, fuel cells, enzymatic reactors, etc.) are particularly welcome. Submissions based entirely on e.g., numerical simulations with commercial CFD codes without novel experimental validation; novel sensing devices without a component of reaction engineering; theoretical mathematics; combustion in the context of energy conversion; or straightforward bioreactor applications (bacteria or animal cells) are highly discouraged, as these will find better fit in other existent journals.
Within the *Chemical Engineering Journal*, the **Green and Sustainable Science and Engineering** section presents papers focusing on innovative scientific and engineering solutions for sustainable future of human beings and nature. Topics in this section include, but are not limited to, the following: 1) Emerging materials and processes for green conversion of resources (including oil, gas, coal, biomass, plastics, and synthesis gas); 2) Green processes and system integration for renewable and clean energy production (including biofuels and H2), advanced treatment of air/water/solids, resource recovery (including nutrients, heavy metals, rare earth elements, and energy), energy-food-water nexus, and minimization of environmental pollution and hazardous materials (including environmental and economic impact assessment); and 3) Innovative separation, purification, and storage technologies for renewable and clean energy, greenhouse gases (e.g., CO2 and CH4), and intermediates/by-products.

The Novel Materials for Energy and Advanced Applications section of *Chemical Engineering Journal* considers papers describing the development of new functional materials and/or materials processing strategies with demonstrated practical applications. Theoretical calculations can be included, but all papers considered must have an experimental component. Any paper with a demonstrated application will be considered, including:

- Materials for sensors (gas sensors, strain sensors, electrochemical sensors, biosensors, optical sensors, or biomedical sensors provided the emphasis is new materials development)
- Biomedical materials (nanomedicine, photothermal/photodynamic therapy, tissue engineering, drug delivery, wound healing, gene therapy)
- Materials for agriculture (agrochemical delivery vehicles, materials for pest management)
- Functional polymer composites (shape memory or self-healing materials with demonstrated applications, flame-retardant materials, adhesives, sustainable materials, thermal management materials, electromagnetic shielding materials)
- Functional surfaces (superhydrophobic/self-cleaning surfaces, antimicrobial surfaces, anti-icing surfaces, anti-corrosion coatings)
- Materials for photo(electro)catalytic fuel production (water splitting, nitrogen fixation, CO2 reduction)
- Materials for solar cells (dye-sensitized solar cells, perovskite solar cells, organic solar cells)
- Materials for electrochemical energy storage (primary and secondary batteries, flow batteries, supercapacitors, dielectric capacitors)
- Materials for thermal/thermochemical energy storage/conversion (phase change materials, energy storage materials, thermolectric devices)
- Energetic materials (explosives, propellants)
- Materials for electrocatalytic reactions (water splitting, hydrogen/oxygen evolution)
- Light-emitting and light-filtering materials (LEDs/OLEDs, photodetectors, optical thermometry, electrochromic materials)

**AUDIENCE**

Chemical and Process Engineers, Applied Chemists and Product Engineers, Biochemical Engineers and Biotechnologists.
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INTRODUCTION

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Environmental Chemical Engineering:

Stephen Allen: Adsorption (liquid and gas); Ion exchange; Water treatment (physico/chemical methods); Air/gas treatment, NOx control, CO2 capture; Constructed wetlands and reed beds for water treatment; Agricultural wastes (liquid and solid); Solid waste treatment and bioconversion; Sustainable development or processes

Tejraj Aminabhavi: Environmental membrane filtration processes; Emerging pollutant separation and solid-waste minimization; Environmental pollution abatement; Effluent or influent treatment by electrocoagulation and membrane distillation; Toxic metal separation and recovery; Acid/flue gas separation; Desulfurization

Dionysios (Dion) Dionysiou: Advanced oxidation processes/technologies (AOPs/AOTs); Photocatalysis; Environmental catalysis; Membranes processes; Electrooxidation, electrochemical methods; Particle separation; Separation processes; Environmental nanotechnology (focus on environmental remediation, environmental sensing)

Chemical Reaction Engineering:

Guy B. Marin: Chemical kinetics; heterogeneous catalysis; (petro)chemical processes, polymerization, reactor design and modelling, reactor scale-up, crude oil refining, natural gas valorisation, renewables

Nuno M. Reis: Micro-reactor technology, fluid mechanics, CFDs, gas-liquid mixing, multiphase reactors, process intensification, biological reactors, biofuels

King Yeung: Heterogeneous catalysis (including environmental catalysis, photocatalysis and enzyme), novel and hybrid reactor system, miniature flow reactor and microreactor, green and fine chemistry

Novel Materials for Energy and Advanced Applications:

Todd Hoare: Functional polymers and polymer nanocomposites; biomaterials and materials for biomedical applications; superhydrophobic/superwetting materials; flame retardant materials; corrosion inhibiting materials; novel encapsulation methods and applications

Dimitris I. Kondarides: Materials for energy storage devices (primary and secondary batteries; supercapacitors); materials for solar energy conversion and storage (photo(electro)catalytic water splitting, CO2 reduction, nitrogen fixation; dye-sensitized solar cells); energetic materials; electromagnetic wave absorbing materials; luminescent materials and phosphors

Theophilos Ioannides: Electrochemical energy storage (batteries, supercapacitors), Dielectric capacitors, Thermal energy storage (phase change materials), Chemical energy storage, Solar evaporation, Thermoelectrics, Electromagnetic wave absorption and interference shielding, Triboelectric generators, Energetic materials

Reviews and Perspectives:

Jesus Santamaria: Submissions on Review Articles and Perspectives will be handled by Professor Santamaria.

Types of papers

The editors make every effort to ensure that manuscripts are fairly and independently reviewed. Submissions which describe novel theory and its application to practice are welcome, as are those which illustrate the transfer of techniques from other disciplines.
Reports of carefully executed experimental work which is soundly interpreted are also welcome. Manuscripts of routine studies, however, presenting experimental data but without any significant new interpretation or novelty, or that are very specific and applied in their scope, will be rejected by the editors as "lacking in novel content".

*Original papers* - these should be complete and authoritative accounts of work, which has a special significance and must be presented clearly and concisely.

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Reporting guidance
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and gender are often incorrectly portrayed as binary (female/male or woman/man) and unchanging whereas these constructs actually exist along a spectrum and include additional sex categorizations and gender identities such as people who are intersex/have differences of sex development (DSD) or identify as non-binary. Moreover, the terms "sex" and "gender" can be ambiguous—thus it is important for authors to define the manner in which they are used. In addition to this definition guidance and the SAGER guidelines, the resources on this page offer further insight around sex and gender in research studies.

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