ceramics

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Editorial

Welcome to *Ceramics*: A New Open Access Scientific Journal on Ceramics Science and Engineering

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The word ceramics comes from the Greek word keramikos, which means pottery and corresponds to a very old human activity. Indeed, one of the oldest materials fabricated in the world is ceramic pottery. Pottery products are made from clay by shaping and heating. Ceramic has a long human history in all cultures dating back several thousand years.

In materials science, three significant classes of materials can be considered:

- Metals and alloys
- Organic polymers
- Ceramics

A fourth class can be added, which is becoming more and more important—the composite materials that are a heterogeneous mixing of materials from the preceding three classes.

From a general point of view, ceramics can be considered as the scientific, technical, and industrial ranges concerning the manufacturing and the properties of non-metallic inorganic solids. In this definition, ceramics include inorganic non-metallic materials fabricated by melting such as mineral glasses or fused refractories, cements and concretes, and plasters.

The general properties of ceramics are:

- High mechanical resistance and high wear resistance
- High refractoriness
- High thermal resistance
- Various electrical properties

Technical ceramics require a larger technicality compared to traditional ceramics, and generally require more important research works and developments. A large part of the present development of technical ceramics is linked to the development of materials science and engineering as well as to the need for new materials with better performances.

The following topics will be considered for the journal:

- Processing: powder synthesis (sol-gel, hydrothermal . . .), shaping, additive manufacturing, rapid prototyping, 3D printing
- Sintering: advanced sintering, non-conventional sintering techniques (SHS, SPS, flash sintering, cold sintering, micro-wave sintering, laser technologies, etc.), reaction sintering, modeling
- Structural ceramics: applications in automotive, aerospace, electrical, military, and energy fields, impact and tribological behavior, refractories
- Ceramics for energy: energy harvesting, storage, batteries, fuel cells, capacitors, thermoelectrics, solar cells, catalysis
- Electroceramics: electronic materials, ionic and electronic mixed conductors, ferroelectrics, piezoelectrics, multiferroics, dielectrics, thin films

- Transparent ceramics: optical materials, optical spectroscopic properties, solid state lasers, scintillators, ceramic phosphors for LEDs, protective ceramics for windows, domes, armor applications
- Membranes and coatings: thin films, layered 2D ceramics, nanoscale composites
- Ceramics for environmental applications: photocatalysis, solar applications, environmental protection (clean air, water), porous ceramics (automotive, advanced industrial cycles, energy technologies)
- Ceramics for nuclear energy: nuclear fuels, neutron absorbent ceramics, nuclear wastes
- Electrical and magnetic ceramics: passive ceramic components, LTCC, semi-conductors, magnetic ceramics, electrically or magnetically tunable ceramic devices
- Ceramics for healthcare: ceramics for orthopedic, dental, cardiovascular, and cancer treatments, bioceramic-cell interactions, bioglasses, biomineralogization, drug delivery, in vitro and in vivo studies
- Ceramic matrix composites: ceramic fibers, interfaces, interphases, nanocomposites, polymer derived ceramics, fiber reinforced composites, ultra high temperature ceramics, MAX phase ceramics, thermal and environmental barrier coatings
- Modeling, simulation, design: computational modeling, simulation of structural dynamics, atomistic studies, bonding behavior, novel ceramics and compounds, in situ experiments
- Traditional ceramics: raw materials, porcelain, glazes, glass and vitreous ceramics, pigments, restoration, tiles, tableware, artwork

The properties of ceramics depend on the final microstructure obtained after fabrication (sintering, melting, etc.). The control of the microstructures is fundamental and is of great importance for the ceramic behavior. This is true for all applications, and thus requires the control and optimization of the fabrication process of ceramic materials. Therefore, special attention must be paid to all processes in order to obtain the appropriate microstructures for obtaining the desired functional or structural properties. The improvement of ceramic materials demands an increase in our efforts in the ceramic science and engineering fields.

We hope that the MDPI *Ceramics* open access journal will contribute to this improvement. The journal has a strict peer-review policy and aims to have minimum delays between submission and publication. As Editor-in-Chief, I would like to encourage all interested scientists worldwide to submit their research to this exciting new journal. Together with our Editorial Office and Editorial Board, I am looking forward to contributing to the inevitable success of *Ceramics*.