

Special Issue

Advances in New Multifunctional Hard Materials

Message from the Guest Editors

Cemented carbides composed of WC and Co provide an excellent combination of hardness, fracture toughness and wear resistance. Nevertheless, the hard metal industry has become interested in the partial or total substitution of W and Co, not only due to economic factors—impinged by their use in Li-ion batteries in the automotive industry and their classification as CMRs (Critical Raw Materials)—but also health concerns (REACH-UE and NTP-US programs). In recent years, there have been several publications about alternative metallic binders, such as Fe, Ni and HEAs (High-Entropy Alloys); alternative ceramic phases, such as titanium and tungsten borides, niobium carbide, titanium, vanadium, and tantalum carbonitrides; and HECs (High-Entropy Carbides). Recently, the additive manufacturing of hard metals, especially using the binder jetting technique, seems to be an alternative to traditional powder metallurgy. The good performance of these new materials depends on the tailoring of several factors, such as the starting powders, processing route, and microstructure, which lead to optimum mechanical properties for specific applications.

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Deadline for manuscript submissions

15 November 2025



Crystals

an Open Access Journal
by MDPI

Impact Factor 2.4
CiteScore 5.0



mdpi.com/si/191496

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Message from the Editor-in-Chief

Welcome to *Crystals*, the journal dedicated to the fascinating world of crystallographic research! Crystals are more than mere decorative elements; they hold the key to understanding the fundamental structure of matter. Our mission is to explore the crucial significance of this research across various fields. From medicine to technology, chemistry to geology, crystals play a vital role. Their structure provides insights into new advanced materials, innovative drugs, and groundbreaking technologies. Through *Crystals*, we delve into the microscopic world to discover solutions that will shape the future. Join us on a journey through the *Crystals*, where science merges with beauty and innovation.

Editor-in-Chief

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