Special Issue

Hardmetal

Message from the Guest Editors

'Hardmetal' has a very particular meaning – it is not about a hard metal in general - it means a composite of (typically) tungsten-carbide grains in a cobalt matrix, the so called 'binder' (CoWC). It is used as inserts in all sorts of tools in a wide variety of applications for metal cutting and rock drilling and wherever high wear resistance is needed.
Historically it has been around for ca 100ys, and it is industrially prepared by a sintering process. Powders/grains of the hard constituent is mixed with the binder, compressed and sintered at about 1500C. Obviously this concept has experienced substantial development over the years. However, these improvements are still rather incremental, and today's product is not dramatically different from the earlier. Moreover, the cobalt content is now considered becoming increasingly problematic. Cobalt is relatively expensive and has recently become suspect of being carcinogenic. Also, the mining of cobalt in areas like Congo, has made it a 'conflict mineral'. Thus, there is a definite strive to replace Co with 'friendlier' alternatives.

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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.

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