Special Issue

Advanced Microwave Dielectric Materials

Message from the Guest Editor

The evolution of wireless communication systems necessitates advancements in microwave dielectric materials. Traditionally, these materials focused on temperature-stable ceramics with high relative permittivity for 2G and 3G base stations, and metallised ceramic rods for 4G filters. However, 5G and forthcoming 6G systems demand ceramics with low permittivity and near-zero temperature coefficients. Currently, microwave dielectrics serve as base station filters, while handheld devices employ acoustic wave filters. Yet, there's a pressing need for cost-effective antennas and low permittivity dielectrics to enhance efficiency and bandwidth. Polymers and ceramic-filled polymers emerge as viable options, offering cost-effectiveness and integration with established processes. However, ceramics retain advantages like lower dielectric losses, stable permittivity, and wider range of values, along with superior thermal and mechanical properties. Future materials such as magnetic oxide circulators, ceramics in polymer matrices, and GaN-on-diamond are anticipated to enter the wireless communication domain.

Guest Editor

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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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