



Antimicrobial behaviour of leached Al-Cu-Fe based quasicrystals

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Abstract:

Statement of the Problem: Over the years, efforts have been made to develop the new materials which show good antimicrobial properties that can be used to fight infections and provide sterilized surface. The major growing concern of Health-associated infections (HAIs) is to control and prevention infection around the world. Clinical evidence shows that copper and silver has intrinsic ability to reduce the microorganism's burden on surface. However, quasicrystalline (QC) materials are yet to be explored. In this study, for the first time, antimicrobial properties of Al-Cu-Fe, Al-Cu-Fe-B and Al-Cu-Fe-Co quasicrystal powders were investigated in the leached and un-leached condition against Gram-negative (*E. aerogenes*, *K. pneumoniae*) and Gram positive (*B. cereus*, *K. rosea*) bacterial environment. Leaching of the powders in 10 M NaOH aqueous solution resulted in the enrichment of Cu and Fe at the surface. Consequently, bacterial activities in the vicinity of the leached quasicrystal powders were inhibited, indicating good antimicrobial characteristics of the leached powders. All the three leached powder samples exhibited antimicrobial activities with a varying degree. From the diameter of inhibition zone, it was deduced that *E. aerogenes* are the most susceptible against the leached powders. The leached Al-Cu-Fe-B and Al-Cu-Fe-Co quasicrystal powders showed nanostructured features on the outer surface. During leaching, the icosahedral structure was retained in all the samples.

Biography:

Aqib Zahoor has his expertise in powder technology. He is currently working on antimicrobial materials. He has done his MS in Materials Sciences from Pakistan Institute of Engineering and Applied Sciences, Islamabad (PIEAS) that is one of the best university in Pakistan.



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