



## Synthesis, Characterisation And Microbial Activity of Mixed 'Transition Metal - Calcium Tartarate' Complexes

Murlidhar A. Betallu<sup>1</sup>, Vijay B. Tadke<sup>1</sup>, Girish R. Pathade<sup>2</sup>, Kailash B. Sapnar<sup>3</sup>  
and Milind B. Ubale<sup>4\*</sup>

1. Department of Chemistry, Fergusson College, Pune, Maharashtra, **INDIA**
2. Department of Microbiology, H.V.Desai College, Pune, Maharashtra, **INDIA**
3. Department of Physics, Fergusson College, Pune, Maharashtra, **INDIA**
4. Department of Chemistry, Vasantrya Naik College, Aurangabad, Maharashtra, **INDIA**

Email: [mbubale@yahoo.com](mailto:mbubale@yahoo.com)

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### ABSTRACT

Many applications of tartrate compounds are reported globally. In the present research work we have synthesized a series of six new mixed transition metal complexes of the type  $[MM'(C_4H_4O_6)_2 \cdot xH_2O]$  (where  $M=Ca$  and  $M= Mn, Fe, Co, Ni, Cu, Zn$ ) by using tartarate as a ligand and are characterised by different analytical techniques such as elemental analysis, TGA, FTIR, XRD, SEM, magnetic susceptibility study, UV-visible spectroscopy etc. Analytical data shows that all complexes exhibited 1:1 (metal: ligand) ratio. IR spectral data shows that bidentate ligand coordinate with metal ion in a bi dentate manner through the two 'O' atoms. TGA of complexes shows that degradation pattern of complexes were in good agreement with recommended formulae of the complexes. XRD technique shows that all the complexes are in polycrystalline in nature. SEM shows morphological features and surface characteristics of complexes. The synthesised metal complexes were then tasted in vitro for their biological activity against *Bacillus subtilis*, *Saccharomyces cerevisiae*, *Aspergillus niger* and *Escherchia coli* to assess their antibacterial and antifungal effects. The bioassays of all the complexes showed a greater inhibitory effect in the form of broad activity spectrum than the individual ligand, which indicates after the coordination the antimicrobial activity is increased.

**Keywords:** Alkaline earth transition metal complexes, TGA, Octahedral geometry, Biological activity.

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