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Optimal addition of Zn nanoparticles in High Temperature Superconductors YBCO leads to reduced corrosion resistance

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Substitutional studies of nonmagnetic zinc (Zn) nanoparticles in the superconductor compound of yttrium barium copper oxide ($\text{YBa}_2\text{Cu}_3\text{-xZn}_x\text{O}_{7-\delta}$) have been carried out on polycrystalline samples to determine the effect of adding zinc (Zn) nanoparticles on the stability of the unit cell structure in the presence of water. The results show that zinc (Zn) doped samples are found to degrade faster than undoped crystalline chemical compounds of yttrium barium copper oxide ($\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$) in water and the extent of degradation increases with zinc (Zn) concentration. The results also show that there is a direct correlation between the structural instability caused by zinc (Zn) substitution at the copper Cu(2) site in copper oxide (CuO_2) planes and its corrosion resistance in presence of water.

Biography

Seema Vats is an Associate professor of Physics at Motilal Nehru College, University of Delhi. Her research interests are in the field of High Temperature Superconductivity and Energy harvesting from non-conventional techniques. She has won the 'Certificate of Appreciation' for the display of the innovation project titled "Generation of Electricity using Eco-economical Non-Conventional Techniques" funded by the University of Delhi. She has several articles published in international and other reputed journals. She has been a Resource Person for Curriculum development and drafting Learning outcomes for students at higher secondary school level. She has won 1st prize for 'Best Innovation Poster' in the 2nd International Conference on Entrepreneurship, Innovation and Leadership (ICEL-2018). She is presently a President of the Indian Association of Physics Teachers, Delhi and Haryana (IAPT RC-01) which is a national level voluntary organization of Physics teachers having more than 8000 life members from India and abroad.

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