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Fiber reinforced magneto polymer matrix composites

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Magneto polymer matrix composites (MPMC) are a new class of magnetic polymer materials which have evolved as potential materials for tomorrow's aircraft structures. They encompass magnetic, particulate strengthening (dispersion strengthening) as well as fiber reinforcement/strengthening characteristics which are sought out to be utilized toward making efficient future aerospace composite materials. Various types of ferrites including barium, cobalt, iron and strontium were explored for being used in making new composites. In the present talk, I will present a general overview of the synthesis, structure, properties, thermodynamics, surface chemistry and phase transformations of individual ferrites and clusters of ferrites as fillers. A discussion about control of properties with the surface functionalization, modification, emulsification/compounding/blending, heat treatment (phase transformation and separation) and control of processing conditions (temperature, pressure and geometry of mold) will be presented. These smart materials have a wide range of potential applications in medicine, drug delivery, bioimaging, biomarking, tissue engineering, electromagnetic interference (EMI) and electromagnetic force (EMF) shielding and as competent materials for aerospace structural applications.

Biography

Muhammad Musaddique Ali Rafique has completed his PhD in 2018 from RMIT University, Melbourne, Australia. His areas of expertise are; metallurgy, materials science, additive manufacturing and modeling and simulation. He is a member of MRS, TMS and other reputable societies. He has authored and coauthored more than 14 papers in reputed journals and has been serving as Reviewer and Editorial Board Member of reputed periodicals as well.

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