

Preface

This book focuses on the development of novel multifunctional magnetic iron-based solution in order to use in thermal spray technique. The study deals with the influence of three organic chelating agents; i.e., citric acid (CA), polyvinyl alcohol (PVA) and oxalic acid (OA), on the topography, physical properties and phase of solution precursor plasma spray (SPPS)-deposited spinel ferrite splats. The concentration of all chelating agents in the solution precursor was fixed at 10%. After the plasma sprayed cobalt ferrite splats were collected, their surface topographies, surface roughness, equivalent diameter (E.D.), elongation factor (E.F.), degree of splashing (D.S.), and elemental composition were characterized using various materials science techniques. Moreover, the concentration of citric acid in the solution precursor was varied from 5 to 20% to study the effect of the chelating agent contents on the phase composition of cobalt ferrite splats. The splats obtained from CA presented the smoothest surface followed by those splats obtained from OA, PVA, and without chelating agent, respectively. The Raman spectroscopy analyses revealed eight phases in the whole population of splats. Thus, chelating agents influenced the phase composition of cobalt ferrite splats and the highest percentage of cobalt ferrite (CoFe_2O_4) splats was observed with using CA. Finally, the CA concentration influenced the phase composition of cobalt ferrite splats and more than 90% of cobalt ferrite phase was formed when using 20% CA.

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