Effects of Particle Conductivity on the Fe-Si co-deposition Process

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Composite iron deposits containing non-conductivite Si particles and conductive Si-Fe alloy particles with an average size of 1µm were prepared in circulating solution, the effects of particle conductivity on the co-deposition process of particles were investigated. The results show that high conductivity contributed to the co-deposition process of particles into the composite coatings, and in a mode of "cladding" for the co-deposition of conductive Si-Fe particles, while that for non-conductive Si particles was "embedding" mode. At the same time, with increasing the conductivity, the co-deposition process of particles was obviously deviate from the Guglielmi model. A possible mechanism on the forming process was discussed.

Keywords: Fe-Si coating; Electrodeposition; Particle; Conductivity; Co-deposition

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