A Numeric Application Using Diffusion Limited Aggregation Model for the Manganese Dendrites

Mehmet Bayirli and Hakan Kockar

Physics Department, Science and Literature Faculty, Balikesir University, Cagis, 10145, Balikesir, Turkey

Reprint requests to M. B.; Fax: +(90) 266 6121215; E-mail: mbayirli@balikesir.edu.tr

Black deposits known as manganese dendrites often mark the surfaces of magnesite ore. These have fractal appearance, but the origin and characteristics properties of this morphology and the numerical computation of its geometry have been little studied. The shapes and fractal properties of the manganese dendrites from several different origins were analysed by means of the formation mechanism and Monte Carlo simulation study. These are obtained by the stick probability concepts from the dendrites to compact patterns as the geometrical structures using the diffusion-limited aggregation model. The fractal dimensions were also computed with the stick probability as the numerical equation. The results of the stick probability parameters are compared with the real and arbitrary simulation data and can be helpful to describe the natural and the experimental dendritic patterns.