2002 Vol.37 No.1 pp.117-124 DOI:

Stability of Crystal Growth Face and Dissolution Face in Crystallization from Solution under Microgravity

ZHU Zhen-He,[1,2,3] LUO Lin,[1,4] LI Chao-Rong[1,3] and GE Pei-Wen[1,3]

[1] Institute of Physics, The Chinese Academy of Sciences, P.O. Box 603, Beijing 100080, China
[2] Department of Physics, Central University for Nationalities, Beijing 100081, China
[3] National Microgravity Laboratory, The Chinese Academy of Sciences, Beijing 100080, China
[4] Department of Chemistry, University of Science and Technology of Beijing, Beijing 100083, China
(Received: 2001-5-17; Revised:)

Abstract: The stability of the shapes of crystal growth face and dissolution face in a two-dimensional mathematical model of crystal growth from solution under microgravity is studied. It is proved that the stable shapes of crystal growth face and dissolution face do exist, which are suitably shaped curves with their upper parts inclined backward properly. The stable shapes of crystal growth faces and dissolution faces are calculated for various values of parameters, Ra, Pr and Sc. It is shown that the stronger the convection relative to the diffusion in solution is, the more backward the upper parts of the stable crystal growth face and dissolution face are inclined. The orientation and the shape of dissolution face hardly affect the stable shape of crystal growth face and vice versa.

PACS: 81.10.Dn, 81.10.Mx
Key words: microgravity, crystal growth from solution, two-dimensional model, stability of crystal growth face and dissolution face

[Full text: PDF]

Close