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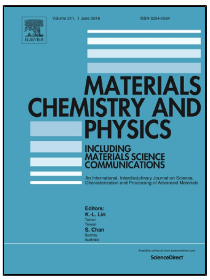

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Strengthening or weakening texture intensity of Zr alloy by modifying cooling rates from α + β region

Linjiang Chai[1,*], Jiying Xia[1], Yan Zhi[1], Ke Chen[1], Tingting Wang[1], Bo Song[2], Ning Guo[2,**]

[1] College of Materials Science and Engineering, Chongqing University of Technology, Chongqing 400054, China

[2] Faculty of Materials and Energy, Southwest University, Chongqing 400715, China

[*]Corresponding author, tel.: +86 23 62563178; fax.: +86 23 62563178; e-mail: chailinjiang@cqut.edu.cn

[**]Corresponding author, tel.: +86 23 68253204; fax.: +86 23 68253204; e-mail: guoning_1000@163.com

Abstract

A typically textured Zr alloy sheet was heat-treated in an α + β region (at 950 °C) and then cooled at three different rates (in water, air and furnace). Microstructures and textures of various specimens were carefully characterized and analyzed by electron channeling contrast (ECC) imaging and electron backscatter diffraction (EBSD) techniques. Results show that rapid cooling in water leads to considerably weakened texture while slower cooling produces perfectly inherited (air cooling) or even intensified texture (furnace cooling). Microstructural examinations reveal that duplex microstructures consisting of fine intersecting plates (martensites) and bulk prior α grains are produced in the water-cooled specimen. Air cooling is also able to induce