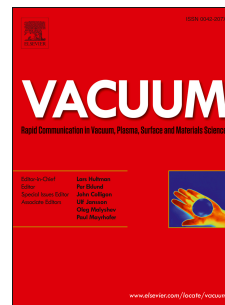


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# Single-crystal growth of iridium with [100] and [110] orientations by electron beam zone melting

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## Abstract

Single crystal of iridium with two different orientations, [100] and [110] has been successfully prepared by electron-beam floating zone melting (EBFZM). The experimental results showed that the iridium single crystal with [100] orientation could be directly prepared without seeding at a low growth rate below 3 mm/min, and the single crystal with [110] orientation could be only obtained by seeding. The competitive growth of the bicrystal demonstrated that the [100] orientation of the iridium single crystal can overwhelm that of the [110] orientation at a growth rate of 2 mm/min. Moreover, the interface growth undercooling including curvature undercooling and kinetic undercooling has been calculated for iridium single crystal with these two orientations. The calculated data and analysis agree well with the experimental results.

**Keywords:** Iridium; electron-beam floating zone melting; single crystal; orientation competitive growth

## 1 Introduction

Iridium belongs to platinum group metals (PGMs), with a high melting point

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