

Improving the efficiency of crystal growth process control by HDC method

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In order to determine the stability of crystallization conditions, four experimental processes of sapphire crystal growth by the horizontal directional crystallization (HDC) method were carried out. The heater power was regulated based on real-time crystal-melt boundary position data obtained using video monitoring, which provided a stable crystal growth rate. The obtained curves of the dependence of the heater power on the length of the growing crystal indicate the similarity of physical phenomena regardless of the degree of melting of the seed crystal, the length of the container, and the effectiveness of thermal shielding. The analysis of the heat flow balance revealed that heat transfer from the heater is dependent on the melt surface area.

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