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論文名稱: 利用質點影像速度儀研究高優態二元溶液在單向凝固過程所產生之雙擴散對流現象

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[摘要]

近年來質點影像測速儀（Particle Image Velocimetry,PIV）已經廣泛地運用在量測各種流場，其優點是可以在不干過程之應用範圍很廣，如化學工業，地質學(土壤和岩石的凍結)，和食品工業(食品的製程和前處理)、合成金屬材料等等，其中凝固過程中雙擴散對流形成的原因一直是過去研究的重點。本研究是利用PIV量測之特性探討不同濃度是以20、22、25、28 %的氯化氨濃度爲研究樣品，利用PIV流場可視化觀察在單一方向凝固過程中二元溶液的流場測暫態溫度分佈與混合區及固態區的成長速率，實驗量測結果顯示濃度越高雙擴散對流現象越明顯，導致低溫的二合區的成長速率也較爲快速，然而固態區的成長速率較不受二元溶液濃度的影響。

[英文摘要]

Particle image velocimetry（PIV）was widely used in measuring many kinds of flow fields recently. It provides a disturbing the flow field. The phenomena of solidification for the mixture of a binary solution occur in a variety of i engineering, geology science, food processing, alloy casting, energy-conservation system and biological technol “double-diffusive convection” during the solidification process was one of the main studying issues in the past ammonium chloride solution with different concentration（20%，22%，25%，28%）on the development of “dc employed to observe flow velocity and morphological conditions associated with unidirectional solidification（UD the growth rate of mushy zone were measured by the designed experimental system. Experimental results revea solution generates stronger double-diffusive convection, causing that the liquid with lower temperature is easier t convection. Moreover, the growth rate of the mushy zone is relatively faster for the binary solution with high conc affected by the concentration of the binary solution.

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