# 使用電化學電容電壓(ECV)法量測砷化鎵銦-磷化銦異質接面傳導帶能隙

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**摘 要**

砷化鎵銦和磷化銦（InxGa1-xAs /InP）異質接面，應用在長波長(λ = 1.6 μｍ)光檢測器 PIN-PDs）及崩潰光二極體。而二種不同能隙半導體接觸時會形成接面能隙不連續，稱band offset 或band discontinuities。由於接面能隙不連續的形成會影響電子－電洞傳輸及發光和量子井 (Quantum well)效率。 接面能隙不連續量測主要有（１）光學量測法（２）電學量測法及（３） 紫外光和X－ray光譜量測法等方式。而這些量測方式中Kroemer建議使用電容電壓量測法，因接面 能隙不連續可經由C-V濃度量測所推得。 電化學電容電壓量測法(electrochemical capacitance-voltage (ECV)，其原理是利用電解液和半導體形成蕭特基(Schottky) 接觸，並使用電流 蝕刻半導體在不同深度加一逆向偏壓量測其濃度。和傳統金屬半導體蕭特基(Schottky) 接觸C-V量測法 比較，其優點為量測深度不受崩潰電壓限制，且快速形成蕭特基(Schottky) 介面。 本篇論文即使用 電化學電容電壓濃度量測砷化鎵銦和磷化銦異質接面傳導帶差，我們成功量測出 Si-In0.53Ga0.47As/InP異質接面△Ec=0.239 ev △Ec/△Eg=0.399 及介面電荷密度σi=1.77×1011 cm-2。

關鍵詞 : InGaAs/InP，band offset，ECV

**目錄**

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