國立臺灣大學技術行銷表

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產品/技術名稱	以溶膠凝膠法製備 I-III-VI_2 族化合物
發明人/單位	呂宗昕、簡思佳、劉治良
產品/技術說明	以溶膠凝膠法製備 I-III-VI_2 族化合物，經由溶膠凝膠法抓住金屬陽離子，再與氣態之 VI 族元素反應；或是先將 VI 族元素與金屬陽離子一起於溶膠凝膠法過程中的溶液，得到的前驅物粉末可在無氣態 VI 族元素的環境下熱處理得到 I-III-VI_2 族化合物。
應用範圍	部分具有直接能隙的粉體(如 $CuInSe_2$ 或 $AgInSe_2$)可用來作為太陽電池的吸收層材料；或可配成漿料塗佈成膜；或粉體可燒結成塊材再經由真空系統(蒸鍍或濺鍍)成膜。
產品/技術優勢	利用溶膠凝膠法製備化合物，在形成溶膠凝膠之過程中，凝膠之形成可使得溶液中的金屬離子分布較均勻，且所得到的粉體顆粒較小而提高了其反應性，較容易合成單相；此外，由於溶液合成較固態合成容易反應，經由溶膠凝膠法可降低粉體之合成溫度與時間。因此，經由溶膠凝膠法可以低成本的方式製備 I-III-VI_2 族化合物，提高其利用價值。
市場潛力	由於大部分的 I-III-VI_2 族化合物多為真空製程，具有高真空設備設置成本與容易浪費原物料之缺點，此外其製備；而溶膠凝膠法為非真空製程，其製備之成本較低，且非真空製程較易量產。
產品/技術 智財權保護方式	專利申請中
圖片 (已公開之成果可提供圖片)	結果尚未公開。

Marketing Abstract of NTU's Invention Disclosure

NTU's docket no:_____(由產學合作中心填寫)

CIAC contact： Tel： e-mail：

Title	Fabrication of I-III-IV_2 compounds via the sol-gel route
Inventor (s)	Chung-Hsin Lu, Szu-Chia Chien, Zhi-Liang Liu
Brief Description	Via the sol-gel route, the formed gels in the solution could trap the metal ions and result in good dispersion. After removing the organic residuals, a sequential heat treatment was performed on the obtained precursors. During the heat treatment, the vapor of VI element could activate the reaction to form I-III-VI_2 compounds. Or I-III-VI_2 compounds could be obtained via adding the VI element in the sol-gel process, followed by the heat treatment.
Fields of Application	Due to the high absorption coefficients and the direct band gaps of I-III-VI_2 compounds, parts of the I-III-VI_2 compound such as $CuInSe_2$ or $AgInSe_2$ have the potential in applying the absorber materials in thin-film solar cells. The prepared I-III-VI_2 powders could be used as the absorber materials in thin-film solar cells via printing. Or the powders could be sintered to prepare the target for using as the resource of the vacuum systems.
Advantages	Via the sol-gel route, the metal ions in the solution dispersed well due to the existence of the gel, therefore it is easy to fabrication the single phase of I–III-VI_2 compounds. Besides, the sol-gel route could reduce the formation temperature and shorten the formation duration due to the solution reaction. Due to the above advantages, preparing I-III-VI_2 compounds via the sol-gel route has the potential in various applications.
Market Potential	The conventional routes for preparing I-III-VI_2 ternary compounds are usually based on the vacuum system. However, the vacuum system has drawbacks such as the high manufacturing cost and uneffective materials utilization. On the contrary, the sol-gel route has the advantages of low cost and mass production.
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