



## 以兩性離子輔助製備高品質鈣鈦礦薄膜之快速製程技術

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簡歷：

1. 1979, 美國西北大學博士後研究員
2. 1980-1996, 美國西屋科技中心院士
3. 1990, 日本三菱電機材料研究中心客座學者
4. 1996 迄今, 台灣大學教授
5. 2004, 瑞士理工學院客座教授
6. 2010, 美國加州大學客座學者
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**市場及需求：**本技術可廣泛應用於鈣鈦礦太陽能電池。現今全世界對於太陽能電池的市場規模已超過 1200 億美元，其中於室內應用以及疊層行太陽能電池等(未來鈣鈦礦光伏元件之市場標的)，預估於 2022 年市場需求將超過 40 億美元

**技術摘要(含成果)：**本技術以新穎的兩性離子搭配簡單、快速的製程方式製備出高品質低缺陷密度之鈣鈦礦薄膜，以此兩性離子可以有效的提升鈣鈦礦太陽能電池之光電轉換效率以及於高溫高濕環境下之穩定性

**優勢：**製程簡單快速、可適用於大面積塗布製備出高品質鈣鈦礦薄膜

**競爭產品：**薄膜太陽能電池、高分子太陽能電池、染料敏化太陽能電池

**專利現況：**專利申請中

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## Rapid Formation of High Quality Perovskite Thin Film via Dipolar Ion Passivation Strategy

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### Experience:

1. 1979, Postdoctoral Fellow, Northwestern University, Evanston, USA
2. 1980-1996, Fellow Scientist, Westinghouse R&D Center
3. 1990, Visiting Scientist, Mitsubishi Materials and Electronic Laboratory, Mitsubishi Electric Company
4. 1996 to the present, Professor, National Taiwan University
5. 2004, Visiting Professor, Swiss Institute of Technology
6. 2010, Visiting Professor, University of California at Santa Barbara
7. 2015, Visiting Professor, Harvard University

<http://www.mse.ntu.edu.tw/~frontier/profileC.htm>

**Market Needs:** This technology can be widely applied at the perovskite solar cell. Nowadays, the market size of photovoltaics is over 120 billion per year. Among of them, the market needs of indoor applications and perovskite/silicon tandem solar cell or module are speculated to reach over 4 billion USD per year at 2022.

**Our Technology:** High quality and low defect density of perovskite films can be fabricated with a simple and rapid process via dipolar ion assistance. Moreover, with dipolar ion, the power conversion efficiency and stability at 85°C/85RH% can be enhanced as well.

**Strength:** simple and rapid process, suitable for large scale coating technique

**Competing Products:** thin-film solar cell, polymer solar cell, dye-sensitized solar cell

**Intellectual Properties:** patent pending

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