



# 2023「中技社科技獎學金」

2023 CTCI Foundation Science and Technology Scholarship

## 研究獎學金

Research Scholarship

# Development and application of electrochemical desalination techniques based on Prussian blue analogues



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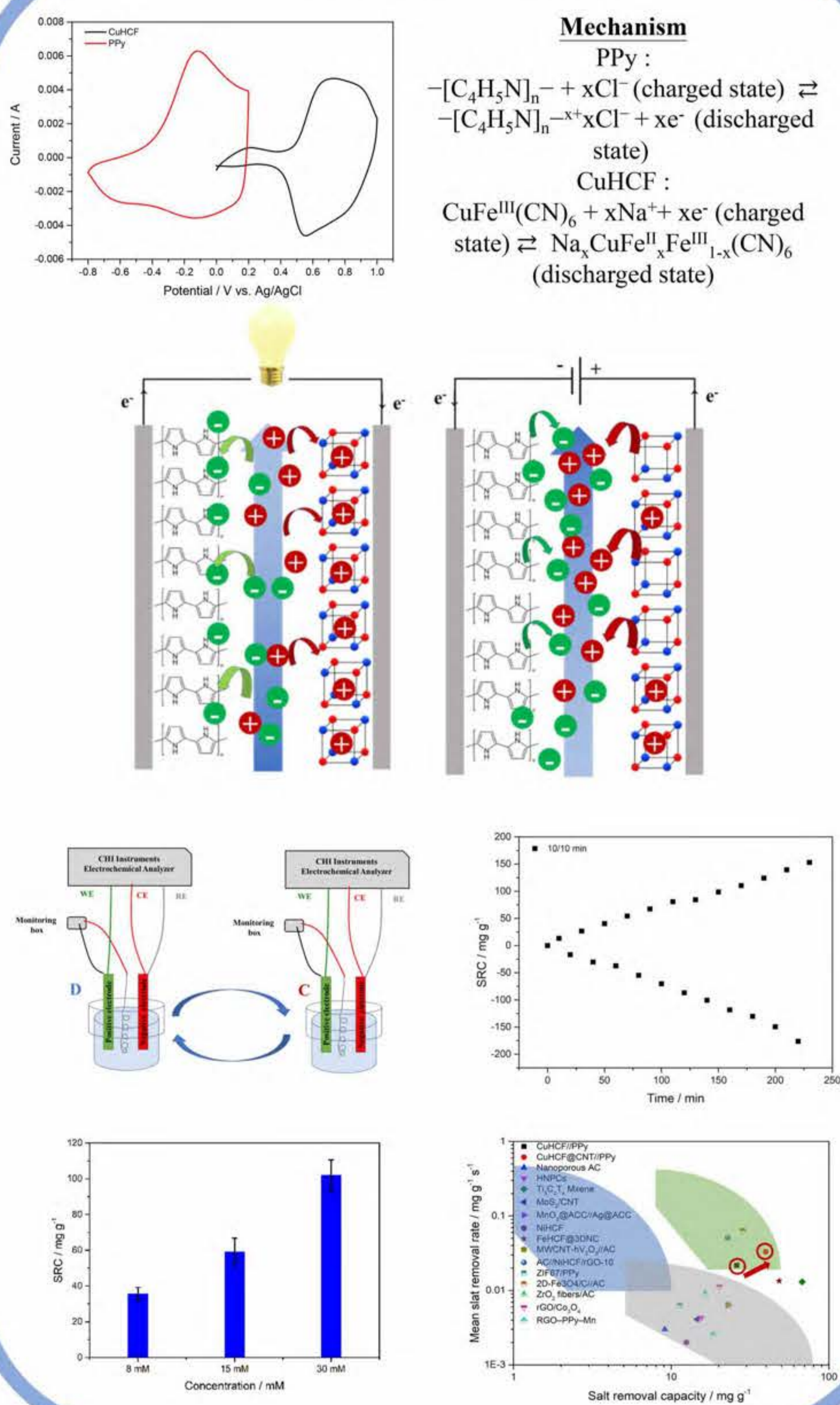


### 研究重點

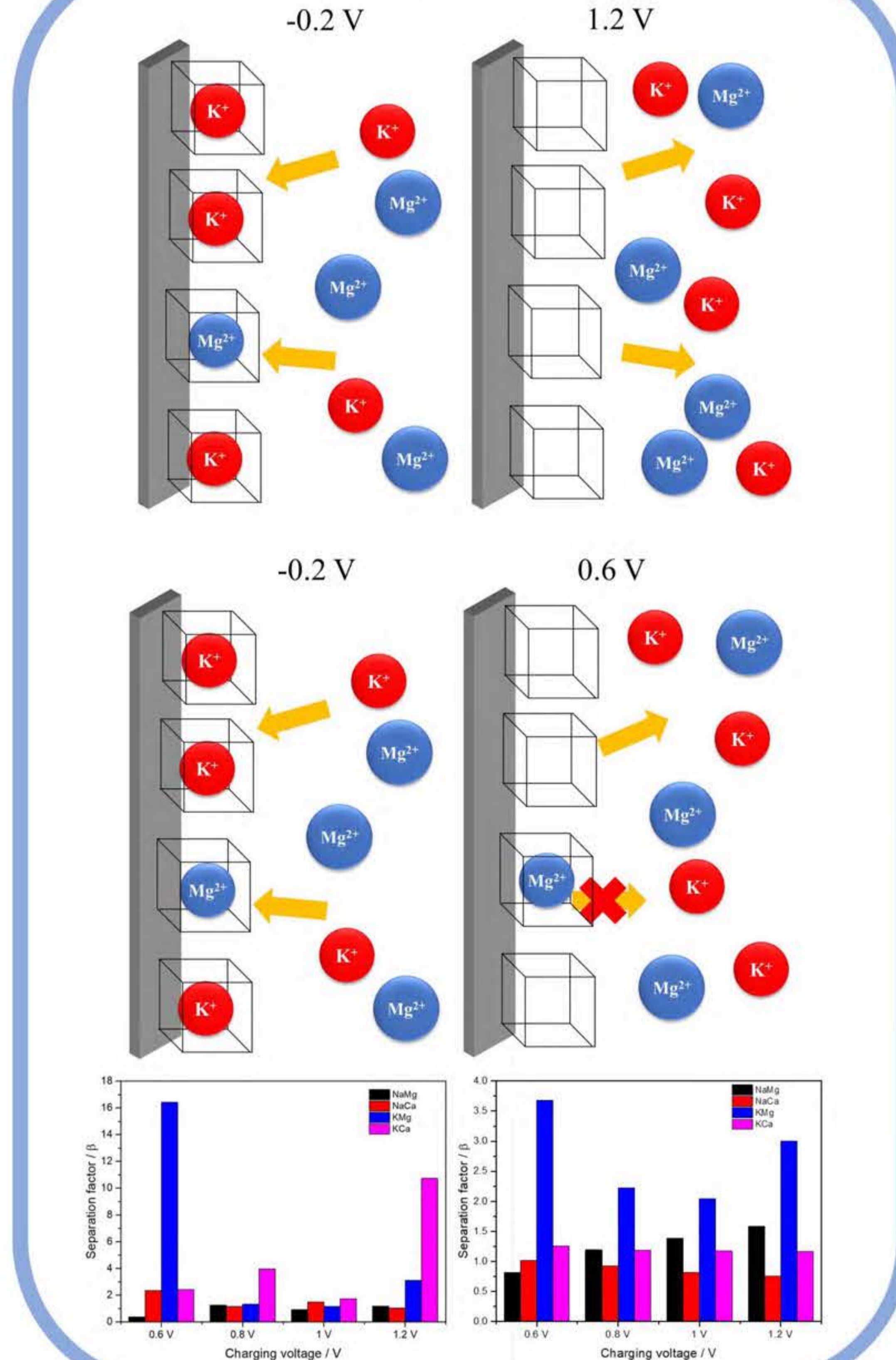
Electrochemical deionization (ECDI) is a versatile method for various water treatment applications, including seawater desalination, water softening, and heavy metal removal. Prussian blue analogues (PBAs), as Faradaic materials, have demonstrated significant potential. Utilizing a combination of CuHCF and PPy as an efficient membrane-free ECDI system, it is capable of handling higher concentration solutions, exhibiting excellent salt removal capacity (SRC) across various cations. The deionization effect of CuHCF is further enhanced through doping with carbon nanotubes. Additionally, the study investigates the impact of voltage on the system, proposing that ion selectivity can be modulated by controlling the voltage. We have also successfully integrated a self-powered ECDI system combining solar cells and zinc-air batteries, which can provide both energy and water sources for areas with uneven distribution of power grids.

### 研究成果

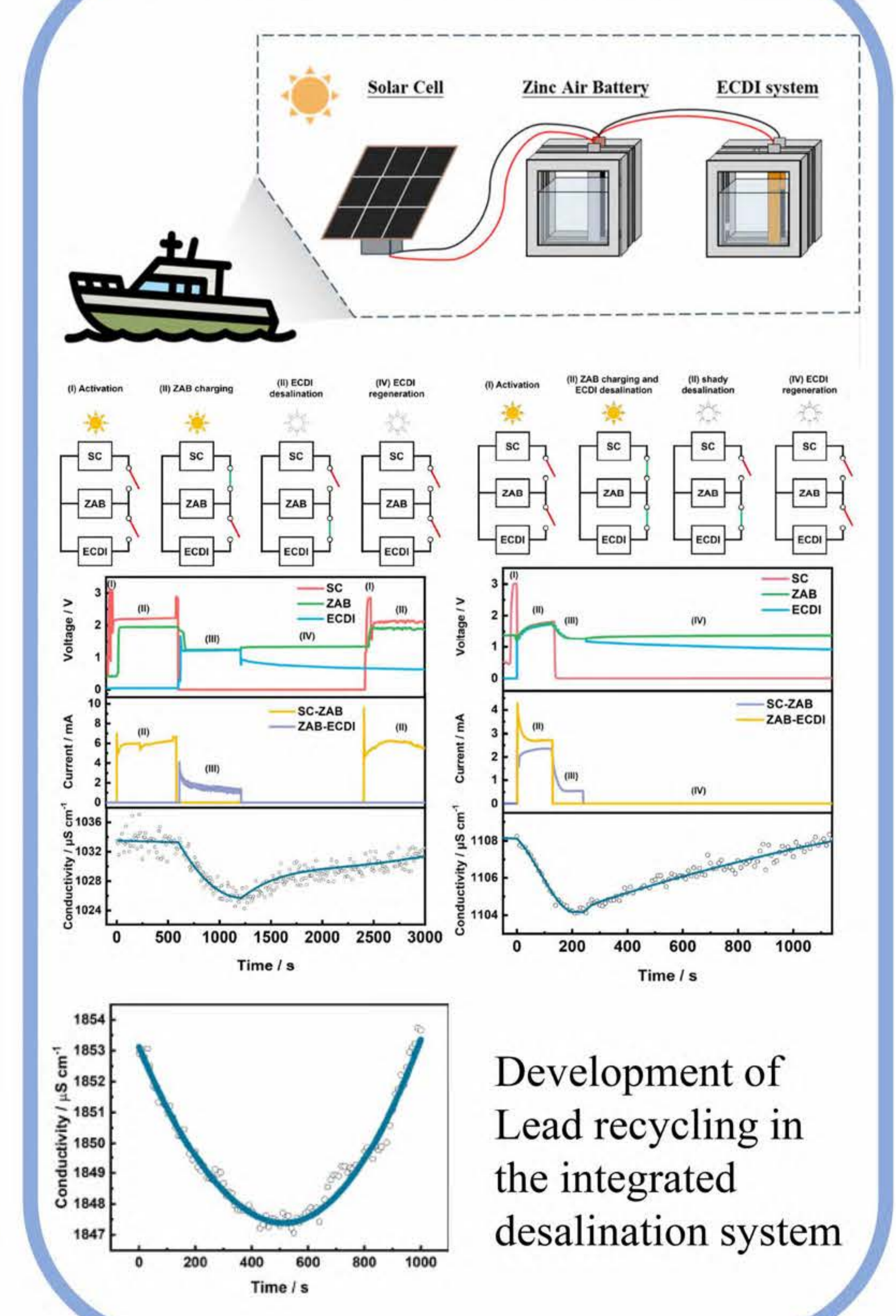
#### Hybrid ECDI



#### Ion selectivity



#### Self-powered ECDI system



### 研究生活及心得

感謝中技社與各位委員的認可，雖然研究路上遇到許多困難及挑戰，當得到成果的那刻就有如品嚐到種種辛苦所灌溉的果實。感謝胡啟章教授的指導，讓我能夠盡情的嘗試，在迷失方向時鼓舞我，讓我能不懼前方困難勇往直前。謝謝實驗室的朋友們，做實驗到半夜的日子如今歷歷在目，在吃飯喝酒時偶爾也會想到實驗相關的事情共同討論。最後也謝謝支持著我的家人們，我將繼續努力，期望有天能夠為社會盡一份心力。



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