



含溶解性鹽類或酸類之排水處理

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簡歷：

- 研究室網頁（綠色科技研究室）<https://webpageprodvm.ntu.edu.tw/GTLab/>
- 美國柏克萊國家實驗室博士後研究員
- 美國阿崗國家實驗室訪問學者

市場及需求：

傳統含鹽類排水處理方法，多係使用熱蒸發罐將含鹽排水中水分蒸發，留下鹽結晶固體，抑或是添加混凝劑將水中鹽類沉澱移除；含酸根離子排水處理方法，多係透過化學酸鹼中和反應來提升排水之酸鹼值（pH），這些技術需持續添加化學藥劑（例如氫氧化鎂等），因此，此類處理方式之藥劑成本較高，且處理後排水中恐生成沉澱污泥，需加設一後端固液分離設施，並不符合綠色科技之原則。

技術摘要(含成果)：

本發明利用一具能源效率之電動力分離裝置，將待處理排水中具污染疑慮之鹽類或酸類物質，濃縮成一體積相對較小之副產品，並確保處理後排水能符合放流水排放標準，且此濃縮產品可再作為綠色循環產品，符合循環經濟之理念。

優勢：

本發明中所述之電動力分離裝置具高能源效率，因此能源成本低，且不需使用額外化學藥劑，亦不產生污泥，綜合經濟效益高。

競爭產品：

含溶解性鹽類或酸類之排水為常見食品、製造及觀光等產業之副產品或廢水，此溶解性鹽類常見為氯鹽或鈉鹽等，酸類常見包括硫酸鹽、硝酸鹽或有機酸類等物質。傳統含溶解性鹽類排水之處理方式包括蒸發罐、混凝沉澱移除、離子交換樹脂吸附等；傳統含酸類排水之處理方式包括添加鹼劑中和等。

專利現況：

本研究團隊具有數年研究經驗，此專利為科技部「開發整合式精準分離技術應用於有價資源之梯級回收邁向農業循環經濟」計畫執行成果。

聯絡方式：

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A METHOD OF TREATING DISCHARGES CONTAINING DISSOLVED SALTS AND ACIDS

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- Visiting Scholar, Argonne National Laboratory, USA

Market Needs:

Traditional salt-containing wastewater treatments mostly use evaporators to remove water from wastewater and produce salt crystal solids, or adding coagulants to remove salt from the water. Similarly, acidic wastewater treatments mostly use alkaline neutralization to increase the pH of wastewater. Since these treatments require continuous addition of chemicals, their costs for chemicals are quite high. Also, these treatments will generate sludges, and thus a solid-liquid separation facility is required, which does not conform to the principles of green technology.

Our Technology:

This invention is different from the traditional thermal treatment or dosing neutralization method, which uses an extra-large amount of energy or alkaline agents. This method can concentrate the salts or acidic substances into a relatively small volume of byproduct, while ensuring another stream of treated wastewater can meet the national discharge standard for wastewater. This concentrated byproduct can be used as a green resource, in line with the concept of a circular economy.

Strength:

This invention uses an energy-efficient electrokinetic separation device to remove the salts or acidic substances that are suspected of pollution in the wastewater to be treated.

Competing Products:

Traditional treatment methods for wastewater containing soluble salts include evaporation tanks, coagulation precipitation removal, and ion-exchange resin adsorption. Traditional treatment methods for acid-containing wastewater include neutralization by adding alkaline agents. These treatments require additional chemicals and thus result in a huge quantity of sludge.

Intellectual Properties:

The research team has several years of research experience. This patent is the outcome of the implementation of the Ministry of Science and Technology's project entitled "Development of Integrated Precision Separation Technology for Cascade Recovery of Valuable Resources Towards a Agricultural Circular Economy".

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