附件四、技術說明表

一種電容式濃縮減廢水處理系統的控制方法

發明人： 侯嘉洪 教授
單　位： 國立臺灣大學　環境工程學研究所
簡　歷： 個人網頁
(http://homepage.ntu.edu.tw/~chiahunghou/)

市場及需求:
廢水中含氮物質(如銨離子、硝酸鹽、或亞硝酸鹽)、重金屬(如鎳、鉻、或銅)、貴金屬(如金或銀)、稀有金屬(如鋰)、其它特定帶電離子之濃縮與回收處理

技術摘要(含成果):
本發明將薄膜電容去離子裝置應用於廢水濃縮處理，為一種薄膜電容去離子裝置的操作系統流程，藉由本發明所接露之操作步驟與管線系統設計，透過可程式化邏輯控制器操作電源供應器、電磁閥、以及水泵，達到濃縮水溶液中帶電離子之目的。

優勢:
由於薄膜電容去離子技術具有低能耗與高產水率之技術特性，因此將薄膜電容去離子技術應用於濃縮處理，可在低處理成本下有效將目標水體進行濃縮處理。再者，薄膜電容去離子技術具有高度操作彈性，可因應待濃縮水體之水質狀況調整模組組裝方式、模組操作模式，進而達到不同濃縮倍數之濃縮效果。共重要的是藉由電容去離子模組在運作過程中，於多孔性碳電極間的微尺度酸鹼度變化，使得目標離子型態有利於在電場作用中被吸附去除，有別於傳統需藉由加藥調整酸鹼度之處理方法，具有節省加藥成本與高度環境友善性之優勢。

競爭產品:
電透析技術

專利現況:
目前尚無將電容去離子技術應用於廢水濃縮處理之相關專利與研究，本發明為本研究團隊多年來累積之薄膜電容去離子技術之研究經驗，研究範圍涉及材料製備、模組設計、電路設計、操作模式等，此乃團隊內部人員累計多年經驗。

聯絡方式(請不用填):
臺大產學合作總中心
Tel: 02-3366-9945,　E-mail: ordiac@ntu.edu.tw

A novel capacitive concentration system for wastewater treatment

PI： Prof. Chia-Hung, Hou
Graduate Institute of Environmental Engineering, National Taiwan University.

Experience:
Website: (http://homepage.ntu.edu.tw/~chiahunghou/)

Market Needs:
Concentration and recovery of inorganic nitrogenous wastes, heavy metals, precious metals, rare metals, and specific ions from waste water.

Our Technology:
A membrane capacitive deionization (MCDI) control method and an automatic control system are provided. The automatic control system comprises an automatic server and a MCDI device. The MCDI device applies voltage to electrode plates for adsorbing ions in aqueous solution according to a charging signal transmitted from the automatic control server. After the electrode plates adsorb ions and reaches a specific status, the MCDI device executes a resting procedure according to a resting signal transmitted from the automatic control server, and grounds the electrode plates for releasing attached ions. After a specific period, the MCDI device elutes the electrode plates via aqueous solution for recovering the electrode plates according to an eluting signal transmitted from the automatic control server.

Strength:
The concentration of specific ions from aqueous solution can be simply achieved by membrane capacitive deionization (MCDI) due to its small ground occupation, high capacity, high operating flexibility, low energy consumption and high movability.

Competing Products:
Electrodialysis (ED)

Intellectual Properties:
Our group focus on the development of membrane capacitive deionization technology for many years, we are interested in the materials used for electrode preparation, the design for membrane capacitive deionization device, the operational mode for deionization etc.

Contact (do not need to fill out):
Center for Industry-Academia Collaboration, NTU
Tel: 02-3366-9945, E-mail: ordiac@ntu.edu.tw