

## 附件四、技術說明表

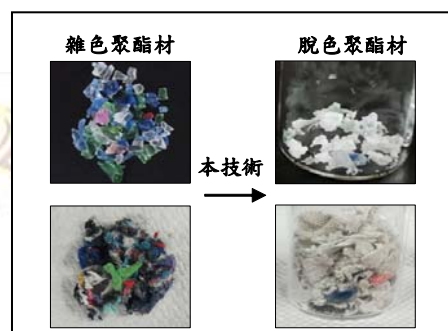


### 聚苯二甲酸烷二醇酯材的處理方法

提案人：吳嘉文 教授

單位：國立臺灣大學 化學工程學系/研究所

簡歷：<http://www.che.ntu.edu.tw/che/?p=391>



**市場及需求：**近年全球再生聚酯的需求量大增，市場上供不應求。再生聚酯的主原料為廢棄無色聚酯瓶；然而，其數量已無法滿足市場對再生聚酯之需求。廢雜色聚酯材(主要為聚酯瓶及紡織品)被認為有潛力作為再生聚酯的下一代原料來源來滿足市場需求；然而，由於染料的存在，由其得來的再生聚酯只能降階應用，價格低廉。因此，發展新穎高效脫色技術得到由廢雜色聚酯材而來的脫色再生聚酯為聚酯循環經濟當前最重要的目標之一。

#### 技術摘要(含成果):

本研發成果的三項子技術：(1)溶劑熱處理破損技術、(2)高效溶劑脫色技術、和(3)新穎觸媒催化乙二醇醇解技術，可以高效的將各式雜色聚酯材處理成脫色聚酯材或脫色聚酯單體，滿足市場對高品質再生聚酯的需求。應用領域主要為雜色聚酯材物理和化學回收循環經濟產業。

#### 優勢:

子技術(1)：常壓操作、方法容易實施無需特殊設備、可大幅提升各式聚酯材脫色或化學解聚速率。子技術(2)：脫色溶劑非 VOC、常壓操作、高脫色率、無破壞處理之聚酯材、低回染率。子技術(3)：可自廢棄物取得無需特殊處理即可使用、解聚效率和醋酸鋅觸媒相當、可降解溶於乙二醇裡之色料。

#### 競爭產品:

非本技術得來之脫色再生聚酯及聚酯單體。

#### 專利現況:

(1) 申請中專利：“聚苯二甲酸烷二醇酯材的處理方法”中國專利(中心案號 06A-210403TW)、美國專利申請案號 17/650325、中國專利申請案號 202210112594.X、PCT 申請案號 PCT/IB2022/051100。

(2) 本研究團隊具有多年發展廢塑膠高值化技術相關的研究經驗。

#### 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](mailto:ordiac@ntu.edu.tw)

本資料僅供國立臺灣大學專利/技術申請使用，嚴禁使用全部或部分內容於其他用途。若有疑問請與我們聯繫，我們將盡力協助您。



## Method for Processing Polyalkylene Benzenedicarboxylate Material

**PI :** Prof. Chia-Wen Wu

Department of Chemical Engineering, National Taiwan University

**Experience:** <http://www.che.ntu.edu.tw/che/?p=391>

### Market Needs:

In recent years, the global demand for recycled PET has increased significantly. The main feedstock of recycled PET is waste colorless PET bottles; however, its quantity can no longer meet the market demand. Waste colored PET materials (mainly bottles and textiles) are the next-generation feedstock for recycled PET to meet market demand; however, due to the presence of dyes, the resulting recycled PET has low market value. Therefore, the development of novel and efficient decolorization technology to obtain decolorized recycled PET materials or PET monomer from waste colored PET materials is one of the most important goals of PET circular economy at present.

### Our Technology:

There are three sub-technologies of this research: (1) solvent-assisted disintegration technology, (2) high-efficiency solvent decolorization technology, and (3) novel catalyst catalyzed glycolysis technology. The combination of three sub-technologies can efficiently convert all kinds of colored PET materials into decolorized PET material or PET monomer to meet the market demand for high-quality recycled PET. The application fields are mainly physical and chemical recycling of colored PET materials circular economy industries.

### Strength:

Sub-tech (1) is easy to implement without special equipment and can greatly increase PET decolorization and depolymerization rates. Sub-tech (2) uses non-VOC decolorization solvent which has high decolorization rate, non-destructive towards PET, and low back-staining rate. Sub-tech (3) uses catalysts from waste without special treatment. The depolymerization efficiency is equivalent to that of zinc acetate. It can also degrade the dyes soluble in ethylene glycol.

### Competing Products:

Decolorized recycled PET materials and PET monomers not obtained by this technology

### Intellectual Properties:

(1) Patent pending: "Processing Method of Polyalkylene Benzenedicarboxylate Material" (06A-210403TW, US 17/650325, CN 202210112594.X, PCT/IB2022/051100).

(2) Our research team has many years of research experience in the development of waste plastic high-value technology.

### Contact (do not need to fill out):

Center for Industry-Academia Collaboration, NTU

Tel: 02-3366-9945, E-mail: [ordiac@ntu.edu.tw](mailto:ordiac@ntu.edu.tw)

