

附件四、技術說明表



塑膠微粒定性分析方法建立

提案人： 范致豪 教授

單位： 國立臺灣大學 生物環境系統工程學系

簡歷： http://www.bse.ntu.edu.tw/member?teacher_id=1&page=1

市場及需求：

塑膠原料成分之確認，可應用於工程技術顧問業(含環境檢驗產業)，資源回收業、塑膠製造業等。舉凡承諾進行塑膠回收與使用回收塑料的各種產業，皆有可能應用此技術於製造回收程序中。

技術摘要(含成果)：

環境樣品中的塑膠微粒通常由多種聚合物成分組成，對每種成分的鑑定對於污染控制和風險管理皆至關重要。相較於傳統通過測量其重量和顆粒數來分析環境中的塑膠微粒，將收集到的樣品視為一個整體考慮，本研究採用傅立葉轉紅外線 (FTIR) 光譜來識別測試的塑膠微粒混合物成分，包括聚對苯二甲酸乙二酯 (PET)、聚乙烯 (PE)、聚丙烯 (PP)、聚氯乙烯 (PVC) 和尼龍 (NY)。對於每種測試的塑膠微粒樣品，特徵波之波峰位置是根據其 FTIR 光譜確定的。並同時分析了含有各種測試塑膠微粒成分組合的合成錠片，FTIR 光譜可以識別它們各自的塑料成分。進而提出了一種塑膠微粒鑑定程序。

優勢：

本研究揚棄過往選擇明顯訊號進行鑑別的慣例，選擇具獨特性的訊號做為特徵訊號，即便訊號強度較小，亦不影響判讀的準確性，並交互比對確認不同塑膠成分同時存在並不會導致對塑膠成分的誤判。

競爭產品：

FPA-FTIR、ATR-FTIR、Micro-FTIR、Raman spectroscopy 和 Nuclear Techniques

專利現況：

無

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

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Establishment of microplastic constituent identification

PI : Prof. Chihhao Fan

Department of Bioenvironmental Systems Engineering, National Taiwan University

Experience: http://www.bse.ntu.edu.tw/member?teacher_id=1&page=1

Market Needs:

Identification technology of plastic composition can be applied to engineering technology consulting industry (including environmental inspection industry), resource recycling industry, plastic manufacturing industry, etc. For all industries that carry out plastic recycling and use recycled plastics, it is possible to apply this technology in the manufacturing recycling process.

Our Technology:

The environmental sample of microplastics usually consists of a variety of polymer constituents, and the identification of each constituent is critical for pollution control and risk management. While the ambient microplastics were often analyzed considering the collected sample as a whole by measuring its weight and particle number, this study employed Fourier-transform infrared (FTIR) spectroscopy to identify the constituents of the tested microplastic admixture containing polyethylene terephthalate (PET), polyethylene (PE), polypropylene (PP), polyvinyl chloride (PVC) and nylon (NY). For each tested microplastic, the characteristic wave number(s) was determined based on its FTIR spectrum. Synthetic admixtures containing various combinations of tested microplastic constituents were analyzed, and the FTIR spectra enabled the identification of their respective plastic constituents. A procedure for microplastic identification was proposed.

Strength:

This research discards the previous practice of choosing obvious signals for identification, and chooses unique signals as characteristic signals. Even if the signal strength is small, it does not affect the accuracy of interpretation. After cross-comparison, it was confirmed that when different plastics constituents exist at the same time, it will not cause misjudgment neither.

Competing Products:

FPA-FTIR, ATR-FTIR, Micro-FTIR, Raman spectroscopy and Nuclear Techniques

Intellectual Properties: NO

Contact (do not need to fill out):

Center for Industry-Academia Collaboration, NTU

Tel: 02-3366-9945, E-mail: ordiac@ntu.edu.tw

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