

國立臺灣大學技術行銷表

臺大案號: 06A-101213

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技術名稱	生質原料轉化為生質油之快速熱解系統及其方法
發明人/單位	潘永寧/機械工程系、謝國煌/化學工程系、陳延昌/機械工程系
技術內容	生質原料轉化為生質油之快速熱解系統及方法，其熱解反應設備包含單擠壓導螺桿、連續式之進料系統、燃燒加熱裝置(利用熱解反應產生之非凝結性氣體做為燃料)、冷凝器、固/氣分離系統、觸媒去氧化系統、溫度監控系統及管路輸送系統等。藉由整合控制驅動裝置、熱解反應裝置、氣體/固體分離裝置及觸媒脫氧裝置，可達到縮小設備體積、提升生產效率及產品品質、降低熱解設備製造成本之功效。
技術成熟度	<input type="checkbox"/> 量產 <input type="checkbox"/> 試量產 <input checked="" type="checkbox"/> 雛型 <input type="checkbox"/> 實驗階段 <input type="checkbox"/> 概念 <input type="checkbox"/> 其他
應用方式及 預期產品說明	生質原料之快速熱解系統及其方法，尤指一種可量產製造液態生質油之快速熱解反應系統。此種將生質原料轉化為生質油之製程技術，不僅可將廢棄物轉換為寶貴的能源，且可達到能源再生及再利用之經濟效益與廢棄物減量之環保目的，可謂一舉兩得。
技術創新度/優點	<p>(1)單擠壓導螺桿:本設備在生質原料之輸送及熱解反應是採用單擠壓導螺桿，具等截距、錐形軸，可克服傳統生質原料顆粒大時內部不能熱解之缺點，且具有可變速、輸送快速之優點。此外，本單擠壓導螺桿之材質採用自行研發配製之耐高溫、抗氧化及低膨脹係數之球墨鑄鐵，在高溫熱解反應過程中，導螺桿不會發生挫曲變形及卡鎖無法傳動之問題。</p> <p>(2)裝置一觸媒去氧化系統:在製程中添加觸媒同步進行生質油之催化反應，以進一步提升生質油之品質。</p>
智慧財產權	
已公開之圖片	

Marketing Abstract of NTU's Invention Disclosure

NTU's docket no: _____ (由產學合作中心填寫)

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Title	The Fast Pyrolysis System and Method for Converting Bio-mass to Bio-oil
Inventor (s)	Yung-Ning Pan, Kuo-Huang Hsieh, Yen-Chang Chen
Brief Description	<p>(≤ 100 words of non-confidential information)</p> <p>The apparatus for fast pyrolysis reaction developed herein composes (1) a biomass feeding system, (2) a fast pyrolysis reaction chamber equipped with a single tapered screw extruder together with its driving system, (3) a cyclone, (4) a catalyst deoxidation unit, (5) a quench cooler, (6) a heating (burning) device consisting of a storage tank and the piping system for recycled non-condensable gases. There are two main features in the developed system: a novel reaction chamber consisting of a single tapered screw extruder which is chain-driven by a motor with adjustable rotational speeds for simultaneously feeding and pyrolyzing the biomass, and a catalyst deoxidation unit to further modify the characteristics of the bio-oil produced.</p>
Development Stage	<input type="checkbox"/> Production <input type="checkbox"/> Trial production <input checked="" type="checkbox"/> Prototype <input type="checkbox"/> Lab scale <input type="checkbox"/> Idea <input type="checkbox"/> Others:
Fields of Application	<p>The patent technology can convert the bio-mass, ranging from agricultural wastes to wood by products, to bio-oil by employing the fast pyrolysis process. The environmentally friendly energy system developed herein not only is useful for wastes recycled, but also can attain the renewable energy that can fulfill partially the energy needs in Taiwan. In addition, significant contributions to the machinery, energy and environmental sectors in Taiwan can be expected.</p>
Advantages	<p>(when compared to the existing technologies)</p> <p>The patent technology has merits of simplicity, high production capability, high efficiency, easy to scale-up and low cost. Moreover, the invented system can prevent the drawbacks of currently available fast pyrolysis systems, such as, biomass congestion due to clotting of suspendables and hang-up in the feeding system, the need of using N₂ to fluidize the heat carrier (e.g., sand) and biomass in the system, difficulty in separating the heat carrier from charcoal, difficulty in apparatus scale-up, relatively high equipment cost, etc.</p>
IP Right(s)	
Non-confidential Picture	