

Bio-degradable Synthetic Fibres

生物可降解合成纖維

The disposable and degradable synthetic fibres for textile industry are non-plant based oxo-biodegradable material. The oxo-degradation of synthetic fibres such as polyester are firstly initialised by the synergistic interactions among two or more transition metals. After the degradation by metals to the molecular weight of around 5000 Da, the fibre can be further biodegraded. The developed fibres are able to alleviate the environmental problems caused by waste disposal of synthetic polymers.

利用雙/多金屬離子螯合母粒技術為紡織業開發一次性使用的可降解合成纖維屬於非植物基、氧化生物雙降解材料，利用兩種以上過渡金屬之間的協同作用可引發聚酯等合成纖維材料氧化，使份子量降至約5,000單位，達至可生物降解程度，從而緩解用完即棄的合成合成聚合物產品造成的環境影響。



Application 應用

The disposable and degradable synthetic fibres can be applied to the production of disposable health care products such as hairnet, mask and isolation gown. It could also produce other degradable nonwoven materials such as filters which have specific expiry dates and need to be replaced periodically.

利用雙/多金屬離子螯合母粒技術開發的可降解合成纖維可應用於生產用完即棄的衛生、護理用品如髮網、口罩及防護衣；亦可推廣至生產需定期更換、具一定保質期的可降解無紡布產品，如淨化器濾芯。

Industry Benefits 業界效益

Production process of the disposable and degradable fibres is simple and can make use of current manufacturing equipment. As there is no need to apply any plant-based materials into the production, the cost is low while good mechanical and thermal properties are maintained, fostering a diversified development of degradable textile products.

開發一次性使用的合成纖維生產工藝簡單，無需更換生產設備；由於製作過程不需添加任何植物基成分，可維持低廉的生產成本，所開發的纖維具有較理想的機械和熱性能，保持合成纖維優勢，有助可降解產品多樣化發展。

||| Technological Breakthrough 技術突破 |||

The synergistic effect among two or more transition metals can generate enough energy to overcome the activation energy barrier of synthetic polymers, breaking through the limitation of oxo-biodegradation and extending its application from thin plastic film to synthetic fibres. After over 150 formula tests, it is found that the technique has large potential to be applied to different kinds of synthetic polymers such as polyester.

透過雙/多金屬之間的協同作用可獲取足夠能量克服降解複雜結構聚合物的活化能障礙，突破光氧化降解僅可應用於簡單直鏈聚合物的限制，應用範圍可由薄膜推廣至合成纖維。經過150多種配方測試研發出可應用於聚酯等不同種類聚合物的可降解母粒。

||| Licensing Details 獲取專利 |||

A non-exclusive licence covers right to manufacture the degradable synthetic fibres.

非獨家專利授權製作可降解合成纖維。

Funding
Organisation
撥款機構



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