Technology Request

Production of cyclodextrin polymers at industrial scale to encapsulate textile dyes

Summary

A Spanish technological centre has developed a process to recover the dyes from the waste water of textile industries encapsulating them in cyclodextrins. A semi-industrial scale pilot plant has been set up and currently they look for partners capable of producing cyclodextrins polymers in the amount needed to be used as adsorbent at industrial textile scale. A technical cooperation agreement with the industrial partner is foreseen, and then a manufacturing agreement with end-user industries.

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Details

Description

Textile industries are among the most pollutant ones, especially in the dye and finishing sectors that use big amounts of water contaminating it with a huge variety of chemical products. Colourants are the most problematic because a high amount of them (20-50%) is not absorbed in the textile and remains in the water. Currently there are a lot of synthetic colourants due to their specificity on the fibre they dye, the fashion criteria and the different trademarks.

Cyclodextrins are cyclic oligosaccharides obtained from the breakdown of the starch. They are composed of units of α-D[1,4] glucose in a structure with a hydrophobic internal polarity that allows them to include molecules creating groups of a specific size.

The Spanish centre has set up a semi-industrial scale pilot plant to recover dyes from the waste water by means of cyclodextrins. This process is relatively complex due to: 1st the variety of dyes used to obtain the range of colors demanded by the fashion, and 2nd because of their specific requirements according to the textile substrate used. The prototype is installed in a textile company representative of the sector. In the plant the effectiveness of the cyclodextrines to encapsulate different dyes used in the textile industry has been demonstrated from two points of view: 1st, in the reuse of recovered dyes in a rear dyeing process as the encapsulated dye will not be chemically-altered; and 2nd, the elimination of the dye will result in a reduction of contaminated waste water and also avoid the need for adding more chemicals to clean the water. Finally, eliminating dye from waste water means that it can be reused in other dyeing process, lengthening its life cycle and reducing the quantity of contaminated waste water.

The centre looks for a partner to develop cyclodextrin polymers at industrial level in order to obtain the amount needed to be used at industrial textile scale as adsorbent, so high purity is

not necessary.

The centre has the access to the end-users (textile industries) that will implement this technique in their facilities, so they can put into contact these users with the manufacturer/supplier of the cyclodextrin polymer.

A first technical cooperation agreement will be established between the centre and the industrial partner in order to adjust the cyclodextrin polymers manufacturing process to the specific requirements/characteristics for the encapsulation procedure.

Afterwards a manufacturing agreement will be established in order to produce the cyclodextrin polymers between the manufacturer and the end-users industries.

The technique used to recover dyes in textile industry can be extrapolated to other industries with other necessities in a future.

Technical Specification or Expertise Sought

A manufacturer with expertise in chemical process to transform the cyclodextrins in a polymer is required.

Stage of Development

Available for demonstration

IPR Status

Secret Know-how

Keywords

Technology

02007006	Fine Chemicals, Dyes and Inks
02007014	Plastics, Polymers
03004003	Colours, dyes related to Chemical Technology
03005003	Dyeing related to Textiles Technology
10002007	Environmental Engineering / Technology

Market

08001001	Plastic fabricators
08001018	Polymer (plastics) materials
08001023	Other chemicals and materials (not elsewhere classified)
09004003	Textiles (synthetic and natural)
09008002	Water, sewerage, chemical and solid waste treatment plants

NACE

C.13.3.0	Finishing of textiles
C.20.1.2	Manufacture of dyes and pigments
C.22.2.9	Manufacture of other plastic products
E.36.0.0	Water collection, treatment and supply

E.39.0.0 Remediation activities and other waste management services

Network Contact

Issuing Partner

CONSELL GENERAL DE LES CAMBRES OFICIALS DE COMERC INDUSTRIA I NAVEGACIO DE CATALUNYA

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Open for EOI : Yes

Dissemination

Send to Sector Group

Environment

Client

Type and Size of Organisation Behind the Profile

R&D Institution

Year Established

0

Turnover

10 - 20M

Already Engaged in Trans-National Cooperation

Yes

Languages Spoken

English

Client Country

Spain

Partner Sought

Type and Role of Partner Sought

An industrial partner is sought in order to establish a technical cooperation agreement aimed to establish the requirements to produce cyclodextrins polymers in the amount needed to be used as adsorbent at industrial textile scale.

Afterwards the industrial partner will be connected to end-users industries to define and sign a manufacturing agreement.

Type and Size of Partner Sought

SME 51-250

Type of Partnership Considered

Manufacturing agreement
Technical cooperation agreement