TECHNOLOGY AVAILABLE FOR TRANSFER

A Biopolymer Based Biodegradable Super Water Absorbing Polymer (SWAP) and Process for its Preparation

Key Features

- **Biodegradable hence safe & environmentally friendly**
- **Controlled release of water**
- **Raw materials are abundantly and easily available**
- **Process of synthesis does not require organic solvent**
- **Enhanced absorption capacity of 1.2-1.4 l/g**
- **Low application dosage is 1-4 weight % of soil.**
- **Better absorption capacity in saline solution**

Potential Applications

- **Offer water management solutions for applications with agricultural crops, horticulture, turf, trees and nurseries.**
- **Personal Hygiene products**
- **Controlled-release delivery devices for bio-active agents**
- **As absorbent material in packaging industry**
- **Wound dressing products**
- **Water penetration blocker**
- **Control of water spill**

State of Development

The process has been developed at bench scale. Structural analysis, elemental analysis, thermal stability and water absorption studies have been completed.

Background

Super absorbent polymer (SAP) have numerous practical applications across a number of industries. The market is currently dominated by acrylate based super absorbent polymers. Few of the biodegradable SAP which have started coming up and replacing these are semi-synthetic in composition. The commercial super water absorbing materials are based on acrylic acid and similar molecules that are derived from petrochemical products. These materials have a cross-linked structure and are made of carbon-carbon bonds that are not amenable to biodegradation. In contrast, the present invention provides the technology for a novel biodegradable SAP with controlled release of water.

Technology

The technology provides a novel product and process for a completely biodegradable super water absorbing polymer, which is synthesized by "green process". The novel polymer has enhanced water absorption capacity and is a combination of biopolymer with chelating agent and plant nutrient in specific ratio to develop a biodegradable polymer with a water absorption capacity between 1.2-1.4 l/g. The estimated time based on laboratory observation for biodegradation is around two to three months. The high water absorptive capacity along with the properties like slow release of water and low cost makes it an ideal product for wide scale agricultural use to improve water use efficiently, especially in arid and semi-arid areas.

Market

The SAP market was valued at USD 6.06 billion in 2013 and is anticipated to reach USD 8.78 billion by 2020, growing at a CAGR of 5.5% between 2014 and 2020*. In terms of volume, the global superabsorbent polymers market stood at 1,861.8 kilo tons in 2013. Further, according to marketsandmarkets.com, baby diapers are the topmost application segment with more than 75.2% share by value and sodium polyacrylate dominates as the key type in the Super Absorbent Polymer market. The fastest growth rate till 2019 in the super absorbent polymers market is expected to come from SAP used in construction, packaging, wire and cable, oil and gas, fire fighting which will continue to expand in the coming years.

Thus, the market size and demand for SAP is huge because of the myriad of applications.

Intellectual Property

Patent Pending in India

*http://www.transparencymarketresearch.com/pressrelease/superabsorbent-polymers-market.htm

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