

LOW COST BIOPOLYMER-SILICA HYBRID ADSORBENT

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Product background

- **Adsorbent** - simple operation and implementation, low cost, high performance efficient regeneration and eco-friendly operating system
- **Biopolymer-based hybrid adsorbents** - highly biodegradable and widely available
- **Inulin (biopolymer)** - cheap, versatility, biocompatible, water soluble carbohydrate, non-toxic, hydrophilic and biodegradable
- **TEOS (precursor)** - non-toxic and cheap
- **High adsorption capacity** with surface area of 17.69 m²/g, pore size of 2-50 nm (mesoporous) and pore volume of 0.02 cm³/g

Methodology



Novelty/Inventiveness

Non toxic
Biocompatibility

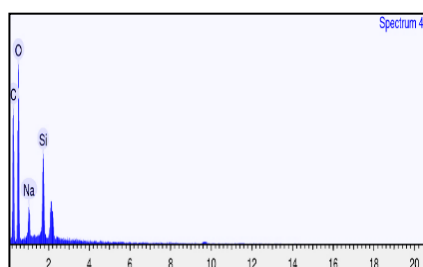
Economical
Cheap/High adsorbent capacity

Eco-friendly
Bio-degradable

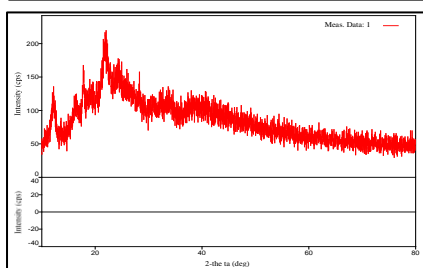
Product characteristic



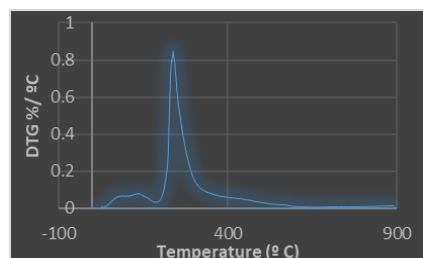
Inulin-silica hybrid adsorbent



- Consist predominantly of carbon and oxygen atoms
- Carbon has an efficient adsorbent property



- In amorphous and semicrystalline form
- Structure Influenced the surface area and porosity of adsorbent



- Thermally stable under 200°C
- Stages of weight loss caused by oxidative degradation

Adsorbent market/ commercialization



Region	Global Trade (%)
North America	36
Europe	20
Middle East & Africa	10
Asia Pacific	24
South America	10



MARKET RESEARCH FUTURE REPORT 2020
Adsorbent's trade growth

6% CAGR
(Compound annual growth rate)

- The incremental growth → **\$1.23 billion** from 2019 to 2024
- **35 % of the growth** → from the Asia Pacific region due to the flourishing of end-user industries
- **China and Japan** → key markets for adsorbent in Asia Pacific

Benefits/Usefulness/Applicability

Reduce water borne diseases

Secure the sustainability of worldwide water supply

Conserve the biodiversity and ecosystem

Thermally stable
Safely used under 200 °C

High surface area
High adsorption capacity

Status of innovation

This product is still under R&D

Potential collaborators

