



BCSIR Laboratories Dhaka, BCSIR

environmentally

Process

Preparation of chitosan-charcoal bio-composite for chromium removal

Area

Effluent Treatment Plant (ETP)

Uses

Waste water treatment/ Water purification



chitosan-charcoal bio-composite

A new composite biosorbent has been prepared by coating chitosan onto charcoal. Chitosan-charcoal composite has applied as the media of biological filters to treat tannery wastewater. Biopolymer chitosan-charcoal composite have been successfully prepared by a simple solution-evaporation method. The morphology and mechanical properties of the chitosan-charcoal composite have been characterized with scanning electron microscopy (SEM) and X-ray diffraction (XRD). The prepared chitosan-charcoal can remove chromium from tannery effluent more than 90% at optimum condition

Scale of Development

The process is standardized at bench scale

Major Raw Material

Shrimp processing wastes (head, shell and tail), charcoal, hydrochloric acid, sodium hydroxide, oxalic acid etc

Major Plant Equipment/Machinery Details of specific application

S.S.Still container, mechanical stirrer and hot plate

Status of Development

This process is accepted by the BCSIR authority and it is ready for commercialization

Ecological/Environmental Impact(if any, specify briefly)

This process is environment friendly and after commercialization this product able to fulfill our national demand

Patenting details Commercialization Status

Ready for commercialization

Techono-Economics


Available on demand

Key wards

Chitosan, Charcoal



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Process	A Process for the Production of Anhydrous Aluminum Chloride from Scrap Aluminum
Area	Lewis acid, polymerization.
Uses	Friedel–Crafts reactions, isomerization, Production of detergents and ethylbenzene
	<p>Aluminium chloride (AlCl_3) is the main compound of aluminum and chlorine. It is white, but samples are often contaminated with iron trichloride, giving it a yellow colour. The solid has a low melting and boiling point. It is mainly produced and consumed in the production of aluminium metal, but large amounts are also used in other areas of chemical industry. The compound is often cited as a Lewis acid. It is an example of an inorganic compound that "cracks" at mild temperature, reversibly changing from a polymer to a monomer. AlCl_3 adopts three different structures, depending on the temperature and the state (solid, liquid, gas). Solid AlCl_3 is a sheet-like layered cubic close packed layer.</p>
Anhydrous Aluminum Chloride	
Scale of Development	The process is standardized at bench scale
Major Raw Material	Aluminium and Hydrochloric acid
Major Plant Equipment/Machinery	S.S. Still container, mechanical stirrer and hot plate
Details of specific application	This product is mainly used for Friedel–Crafts reactions, isomerization, Production of detergents and ethylbenzene
Status of Development	This process is accepted by the BCSIR authority and it is ready for commercialization
Ecological/Environmental Impact(if any, specify briefly)	This process is environment friendly and after commercialization this product able to fulfill our national demand
Patenting details	Patented filed in future
Commercialization Status	Ready for commercialization
Techno-Economics	Available on demand
Cost of Production (Tk.)	900.0/kg
Key wards	Aluminum, Hydrochloric acid, isomer, polymer, detergent



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Process

A process for the production of Production of Lead Acetate from Lead Oxide

Area

textile printing, dyeing, varnishing

Uses

Lead acetate is used as a mordant in textile printing and dyeing, as a drier in paints and varnishes, and in preparing other lead compounds



Lead Acetate

Lead acetate paper is used to detect the poisonous gas hydrogen sulfide. The gas reacts with lead (II) acetate on the moistened test paper to form a grey precipitate of lead (II) sulfide. An aqueous solution of lead acetate is the byproduct of the 50/50 mixture of hydrogen peroxide and white vinegar used in the cleaning and maintenance of stainless steel firearms suppressors (silencers). The solution is agitated by the bubbling action of the hydrogen peroxide, and the main reaction is the dissolution of lead deposits within the suppressor by the acetic acid, which forms lead acetate.

Scale of Development

The process is standardized at bench scale

Major Raw Material

Lead oxide and acetic acid

Major Plant Equipment/Machinery

S.S. Still container, mechanical stirrer, hot plate, round bottom flask, heating mantel

Details of specific application

This product is mainly used as a mordant in textile printing and dyeing, as a drier in paints and varnishes, and in preparing other lead compounds

Status of Development

This process is accepted by the BCSIR authority and it is ready for commercialization

Ecological/Environmental Impact(if any, specify briefly)

This process is environment friendly and after commercialization this product able to fulfill our national demand

Patenting details

Patented filed in future

Commercialization Status

Ready for commercialization

Techno-Economics

Available on demand

Cost of Production (Tk.)

700.0/kg

Keywords

Lead oxide, acetic acid, textile, dye, varnish



BCSIR Laboratories Dhaka, BCSIR

Process

A process for the production of phosphate based dry fire extinguishing agent

Area

Extinguish the ABC type fire

Uses

This product is used for Extinguish the ABC type fire



Dry Chemicals (phosphate based) today's most widely used type of fire extinguisher is the multipurpose dry chemical that is effective on Class A, B, and C fires. This agent also works by creating a barrier between the oxygen element and the fuel element on Class ABC fires.

Phosphate based fire extinguishing

Scale of Development

This process is leased out by BCSIR authority

Major Raw Material

Monoammonium phosphate and ammonium sulphate

Major Plant Equipment/Machinery

Grinding machine, mixing machine, S.S. still container

Details of specific application

Dry Chemical fire extinguishers (phosphate based) extinguish the fire primarily by interrupting the chemical reaction of the fire triangle. The multipurpose dry powder works by creating a barrier between the oxygen element and the fuel element on Class A, B & C fires.

Status of Development

This process is accepted by the BCSIR authority and leased out

Ecological/Environmental Impact(if any, specify briefly)

This process is environment friendly and after commercialization this product able to fulfill our national demand

Patenting details

Patented filed in future

Commercialization Status

This process is leased out by BCSIR authority

Techono-Economics

Available on demand

Cost of Production (Tk.)

150.0/kg

Key wards

Phosphate, fire, extinguisher, dry chemical



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Process **A process for the production of Production of Zinc Acetate from Zinc Oxide**

Area Zinc deficiencies, Antibiotic

Uses Zinc acetate is commonly used as a dietary supplement and in lozenges used to treat the common cold. Zinc acetate can also use to treat zinc deficiencies and treatment of Wilson's disease.



Zinc Acetate

Scale of Development

Zinc acetate is used in chemical synthesis for different pharmaceutical products and as a dietary supplement and in lozenges used to treat the common cold. It along is thought to be a more effective treatment than zinc gluconate. Zinc acetate can also use to treat zinc deficiencies. As an oral daily supplements it is used to inhibit the body's absorption of copper as part of the treatment of Wilson's disease. It is also sold as an astringent in the form of an ointment, a topical lotion or combined with an antibiotic such as erythromycin for the topical treatment of acne, furthermore zinc acetate is commonly sold as a topical anti-itchointment.

The process is standardized at bench scale

Major Raw Material **Zinc oxide and acetic acid**

Major Plant Equipment/Machinery S.S. Still container, mechanical stirrer, hot plate, round bottom flask, heating mentel

Details of specific application This product is mainly used as a dietary supplement and in lozenges used to treat the common cold. Zinc acetate can also use to treat zinc deficiencies and treatment of Wilson's disease.

Status of Development This process is accepted by the BCSIR authority and it is ready for commercialization

Ecological/Environmental Impact(if any, specify briefly) This process is environment friendly and after commercialization this product able to fulfill our national demand

Patenting details Patented filed in future

Commercialization Status **Ready for commercialization**

Techno-Economics Available on demand

Cost of Production (Tk.) 900.0/kg

Keywords Zinc oxide, acetic acid, dietary supplement, lozenges.



BCSIR Laboratories Dhaka, BCSIR

Process

A process for the production of carbonate based dry fire extinguishing agent

Area

Extinguish the BC type fire

Uses

This product is used for Extinguish the BC type fire



Carbonate based fire extinguishing

Scale of Development

This process is leased out by BCSIR authority

Major Raw Material

Mainly fine powder of sodium bicarbonate (NaHCO_3 , baking soda)

Major Plant Equipment/Machinery

Grinding machine, mixing machine, S.S. still container

Details of specific application

Carbonate based dry fire extinguisher is most widely used to extinguish fires involving materials like oil, fats, solvents, gases, paint, varnish and live machinery

Status of Development

This process is accepted by the BCSIR authority and leased out

Ecological/Environmental Impact(if any, specify briefly)

This process is environment friendly and after commercialization this product able to fulfill our national demand

Patenting details

Patented filed in future

Commercialization Status

This process is leased out by BCSIR authority

Techno-Economics

Available on demand

Cost of Production (Tk.)

70.0/kg

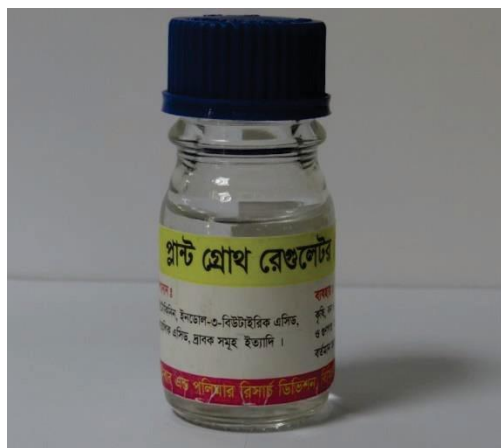
Keywords

Carbonate, fire, extinguisher, dry chemical



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Plant Growth Regulator (PGR)



Major Raw materials:

Cytokinin, Indole-3-butyric acid, Gibberellic acid, Kinetin and others.

Uses:

- + It is used as a plant growth regulator in vegetables, fruit trees and tissue cultures to promote seed germination and to end the dormant state of lateral buds.
- + PGR aids in delaying the aging process of the plant, regulating the transport of nutrients, and promoting fruit formation.



BCSIR Laboratories Dhaka

Fiber and Polymer Research Division



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Polymer Modified Bitumen

Major Raw Materials:

- General bitumen
- Natural polymer
- Polymeric antioxidants
- Organic solvents and others.



Uses:

- Sustainable bituminous pavement construction suitable for Bangladesh.

Salient Features:

- ✚ Renewable resource & huge amount of plastic & rubber wastes will be used.
- ✚ Import of 80-100 grade bitumen will be reduced by 5-8% & thus foreign currency will be saved.
- ✚ Road strength will be twice stronger than normal roads & life-cost of normal roads will be reduced by 20-25%.
- ✚ Large-scale industries will be established & thus employment will be generated.
- ✚ Clean & sustainable environment will be ensured.



BCSIR Laboratories Dhaka
Fibre and Polymer Research Division



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Synthetic Rubber Adhesive

Major Raw materials:

Adhesive grade Synthetic Rubber, Organic Solvents, Hardener, Antioxidants, tackifier, filler, plasticizer, curing agent, vulcanizing agent and sequestering agent.

Uses:

As an Adhesive for Leather-based goods, especially for joining parts of shoe soles and uppers, leather bags, moneybags, parses, leather jackets, etc.

Physical State: Highly Viscous Liquid.

Demand: 20,000 MTs/Year.

Salient Features:

- ✚ Very easy way for preparation of the solvent based adhesive involving simple stirring and mixing process.
- ✚ It doesn't require any mastication process or equipment.
- ✚ Low-cost available solvents were used to make it cheaper.
- ✚ Antioxidant was used for making stable and long-lasting product.
- ✚ It is a product of very high adhesive bond strength.



BCSIR Laboratories Dhaka
Fiber and Polymer Research Division



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Urea Formaldehyde Resin

Major Raw Materials:

Urea, Formaldehyde and others.

Uses:

- ✚ Urea-formaldehyde resin is used by the industries which deal with forest products (ex. hard wood, plywood, particle board etc.) for a variety of purposes.
- ✚ It is also used as adhesive, coating etc





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Production of Conductive paper for electronics packaging

Process	Conductive paper for electronics packaging
Area	Electronics packaging
Uses	Packaging for electronics, circuit board
Salient Features	<ul style="list-style-type: none">• Prohibition of bacterial growth• Protect from Dust particle
Scale of Development	Laboratory scale
Major Raw Materials	pulp
Major Plant Equipment/ Machinery	Polymerization tank, paper machine
Details of Specific application	Packaging for electronics, circuit board
Status of Development	Conductive Sheet formed and tested
Ecological/Environmental impact (If any, specify briefly)	No adverse impact on ecology or environment
Patenting details	Not applied
Commercialization status	Ready for commercialization
Techno-Economics	Available in demand
Key words	Conductive paper, electric packaging



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Production of Activated Carbon

Process	Activated Carbon
Area	Adsorbent
Uses	Purification of Water, Cosmetics, medicine, gas purification, air filtration for mask
Salient Features	<ul style="list-style-type: none">• Treatment of water• Treatment of sewage• Use in different cosmetics (lipstick, cleanser)• Use in medicine
Scale of Development	Laboratory scale
Major Raw Materials	Pulp mill wastes liquor
Major Plant Equipment/ Machinery	Furnace, Chemical reactor
Details of Specific application	Purification of Water, Cosmetics, medicine, gas purification, air filtration for mask
Status of Development	Activated Carbon Prepared and tested
Ecological/Environmental impact (If any, specify briefly)	Prevent surface water pollution as used the pulp mill waste liquor for active carbon preparation. Make fresh and bad smell free environment
Patenting details	Not applied
Commercialization status	Ready for commercialization
Techno-Economics	Available in demand
Key words	Pulp mill liquor, lignin, Active Carbon



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Preparation of lignin-based Resin

Process	Production of Resin from lignin (phenol-formaldehyde)
Area	Plywood adhesives
Uses	Used as adhesives in plywood and particle board
Salient Features	Used as a glue for the preparation of <ul style="list-style-type: none">• plywood• particle board
Scale of Development	Laboratory scale
Major Raw Materials	Lignin, Phenol and Formaldehyde
Major Plant Equipment/ Machinery	Reactor
Details of Specific application	Used as a glue for the preparation of plywood and particle board
Status of Development	Lignin extracted from different biomass and 50% phenol substituted by lignin and resin prepared
Patenting details	Not applied
Commercialization status	Ready for commercialization
Techno-Economics	Available in demand
Key words	Lignin, resin, plywood, additives, particle board



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Preparation of Rayon grade pulp

Process	Rayon grade pulp from lignocelluloses
Area	Rayon
Uses	Production of rayon and different chemicals
Salient Features	<ul style="list-style-type: none">• Preparation rayon• chemicals• drug excipient
Scale of Development	Laboratory scale
Major Raw Materials	Biomass, Lignocelluloses
Major Plant Equipment/ Machinery	Digester, screener
Details of Specific application	Preparation rayon, biofuel, biochemicals and biomaterial
Status of Development	Rayon grade pulp produced
Patenting details	applied
Commercialization status	Ready for commercialization
Techno-Economics	Available in demand
Key words	Biomass, dissolving pulp, rayon

