Chemical Research Division
BCSIR Laboratories, Dhaka

Process	***A Process for the Production of Herbal Hand Wash***
Area	Office, Hospital and House
Uses	Moisturizing hand cleanser

Herbal Hand Wash

To develop an appropriate technology & to find out better utilization of indigenous raw materials in the field of public health care. This Hand wash is rich, anti bacterial, luxurious and moisturizing hand cleanser. Hand wash leaves the skin with smooth, silky feeling while minimizing the irritation associated with some bar soaps.

Scale of Development	The process is already under commercialization
Major Raw Material	Neem , Aloevera & sodium laurel sulphate
Major Plant Equipment/Machinery	S.S. Still container, mechanical stirrer and water bath.
Details of specific application	This product is mainly used for Office, Hospital and House.
Status of Development	This process is accepted by the BCSIR authority and it is already commercialized
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 already commercialized.
Techno-Economics	Available on demand.
Cost of product	150 Tk/ L
Key wards	Neem, Aloevera & sodium laurel sulphate, Glycerin

Chemical Research Division
BCSIR Laboratories, Dhaka

Process ***A Process for the Production of ALOE GEL***

Area	Men & Women
Uses	As moisturizing skin care gel

ALOE GEL

The people of our country use different herbal cosmetics and toiletries for their daily health care, most of these are imported at the cost of our foreign exchange. Herbal plants constitute an invaluable asset of a country. They play significant role in providing primary health care services and also to its overall economy.

Scale of Development	The process is already under commercialization
Major Raw Material	Aloevera, Cellulose, Glycerin
Major Plant Equipment/Machinery	Top load balance, Blender, SS Vat fitted with stirrer, Water bath
Details of specific application	This product is mainly used for Men & Women
Status of Development	This process is accepted by the BCSIR authority and it is already commercialized.
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 already commercialized
Techno-Economics	Available on demand
Cost of product	135 Tk/ Kg
Key wards	Aloevera, Cellulose, Glycerin

Chemical Research Division
BCSIR Laboratories, Dhaka

Process

A Process for the Production of Herbal Shaving Foam

Area	Saloon & Parlor
Uses	Antioxidant enriched Moisturizing Skin care Foam

Herbal Shaving Foam

To develop an appropriate technology & to find out better utilization of indigenous raw materials in the field of public health care. This Shaving Foam is rich ,anti bacterial, luxurious and moisturizing foam. Shaving Foam leaves the skin with smooth, silky feeling while minimizing the irritation associated with some local foam.

Scale of Development	The process is standardized at industry scale
Major Raw Material	Neem oil, Castor oil, sodium laurel sulphate
Major Plant Equipment/Machinery	S.S.Still container, mechanical stirrer, balance, feeling machine
Details of specific application	This product is mainly used for Saloon & Parlor
Status of Development	This process is accepted by the BCSIR authority and it is already commercialized
Ecological/Environmental Impact(if any, specify briefly	This process is environment friendly and this product able to fulfill our national demand
Patenting details	Patented filed in future
Commercialization Status	Already commercialized
Techno-Economics	Available on demand
Cost of product	120 Tk/Kg
Key wards	Neem oil, Castor oil, sodium laurel sulphate

Chemical Research Division
BCSIR Laboratories, Dhaka

Process ***A Process for the Production of Neem Based Cream***

Area	Men & Women
Uses	Antibacterial skin care cream

Neem Based Cream

To develop an appropriate technology & to find out better utilization of indigenous raw materials in the field of public health care. This Neem Based Cream is rich ,anti bacterial, luxurious and moisturizing cream. Neem Based Cream leaves the skin with smooth, silky feeling while minimizing the irritation associated with some local Cream

Scale of Development	The process is already under commercialization
Major Raw Material	Neem , Stearic acid, Cetyl alcohol and Glycerin
Major Plant Equipment/Machinery	SS Vat fitted with stirrer, balance, feeling machine & water bath.
Details of specific application	This product is mainly used for Men & Women
Status of Development	This process is accepted by the BCSIR authority and it is already commercialized
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	Already commercialized
Techno-Economics	Available on demand
Cost of product	200Tk/kg
Key wards	Neem , Stearic acid, Cetyl alcohol and Glycerin

Chemical Research Division
BCSIR Laboratories, Dhaka

Process

A Process for the Production of Baby Liquid Laundry Detergent

Area	Baby Liquid Laundry Detergent is specialized for baby skins and sensitive skins
Uses	Liquid detergent specialized for baby skin

Baby Liquid Laundry Detergent

Baby Liquid Laundry Detergent is a laundry cleaning product which is specialized for baby skins and sensitive skins. Every parent want to give best to their babies and nowadays people became more cautious about their babies health. Baby Liquid Laundry Detergent is one of the most popular and demandable products among new parents. The kind of chemicals and irritants that can be found in the regular detergents are terrifying

Scale of Development	The process is already under commercialization.
Major Raw Material	Coco Betain, glycerin etc
Major Plant Equipment/Machinery	S.S.Still container, mechanical stirrer and water bath
Details of specific application	This product is mainly used for Baby Liquid Laundry Detergent is specialized for baby skins and sensitive skins
Status of Development	This process is accepted by the BCSIR authority and it is already commercialized
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	Patent is already submitted
Commercialization Status	This process is already commercialized
Techno-Economics	Available on demand
Cost of product	125 Tk/Kg
Key wards	Coco Betain, glycerin & EDTA

Chemical Research Division
BCSIR Laboratories, Dhaka

Process	Formulation and development of ultrasound gel from ingredients available in local market.
Area	Hospital and Clinic
Uses	Ultrasonography , ECG

Ultrasound gel

1. There will be no need to import
2. Valuable foreign currency will be saved
3. Easily availability will increase its sufficient use
4. It will be helpful to diagnosis system

Scale of Development	The process is standardized at banch scale
Major Raw Materials	Acrylic polymer, glycerine
Major Plant Equipment/ Machinery	S.S. Still container, mechanical stirrer and water bath
Details of Specific application	This product is mainly used for ultrasonography, FCG at hospital and clinic
Status of Development	This process is clinically tested and ready for submission and it is ready for commercialization
Environmental Inpact	This process is environment friendly and after commercialization this product able to fulfill our national demand
Patenting details	Patented filed in future
Commercialized Status	Ready for commercialization
Cost of Production	100 tk/kg
Key words	Acrylic polymer, glycerine

A Process for the Production of Herbal Body Oil

Process

Area	Baby Liquid Laundry Detergent is specialized for baby skins and sensitive skins.
Uses	For healthy looking skin.

Body Oil

Herbal Body oil is mainly intended for the purpose of skin care and Body messaging. Natural and aromatic range of Herbal body oils are used to gain a fresh feeling. Herbal Body Oils are made from natural oils and herbal extracts. It is aromatic and accentuates our senses. It has cleansing properties and antiseptic activities due to the presence of Turmeric ad Neem

Scale of Development	The process is standardized at bench scale.
Major Raw Material	Vegetable oil, Turmeric extract, Neem oil etc.
Major Plant Equipment/Machinery	Grinder, M.S. with all accessories, Mesh 40-80, Soxhlet extractor, Spring Balance and water bath.
Details of specific application	Herbal Body Oil is mainly intended for the purpose of skin care and Body messaging.
Status of Development	This process is verified by the BCSIR authority and it is ready for acceptance.
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 ready for acceptance.
Techno-Economics	Available on demand.
Key wards	Vegetable oil, Turmeric extract, Neem oil etc.
Cost of product	440 Tk/ L

Process	***A Process for the Production of Herbal Face Wash***
Area	Men & Women
Uses	Clean, clear and healthy looking skin

Face Wash

This Face wash is rich anti bacterial, luxurious and moisturizing Face cleanser. Face wash leaves the skin with smooth, silky feeling while minimizing the irritation associated with some bar soaps.

Scale of Development	Ready for submission for acceptance.
Major Raw Material	Aloevera & Neem Oil
Major Plant Equipment/Machinery	Balance, Blender and water bath and Distilled water plant.
Details of specific application	This process is a moisturizing Face cleanser due to its anti bacterial activities is also keeps Face germ free and save the people from diseases.
Status of Development	This process is already for Submission.
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 submission for acceptance.
Techno-Economics	Available on demand.
Key wards	Aloevera & Neem Oil
Cost of product	150 Tk/ kg

Chemical Research Division
BCSIR Laboratories, Dhaka

Process

A process for the production of chitin from shrimp industry waste

Area	Pharmacy and Food
Uses	Chitin is useful for several medicinal, industrial and biotechnological purposes.

Picture:Chiti

Chitin was first isolated and characterized in 1811 by the chemist and botanist Henry Braconnot. Chitin is structurally 2-acetamido-2-deoxy-D-glucose (*N*-acetylglucosamine) residues linked by ß-(1-4) bonds, is the second richest polysaccharide of animal origin found in nature after cellulose and it is characterized by its fibrous structure.Chitin is extracted from the shells of shrimp, lobster, and crabs. It is a fibrous substance that might block absorption of dietary fat and cholesterol

Scale of Development	The process is standardized at bench scale
Major Raw Material	Shrimp processing waste (Head, body, Tail), Sodium hydroxide, Hydrochloric Acid
Major Plant Equipment/Machinery	S.S.Still container, mechanical stirrer and hot plate
Details of specific application	Pharmaceutical industry and Biotechnology
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
Commercialization Status	Ready for commercialization
Techno-Economics	Available on demand
Cost of Production	14000/Kg
Key wards	Chitin, Shrimp shell, Hydrochloric acid.

Chemical Research Division
BCSIR Laboratories, Dhaka

Process

Production of chitosan from shrimp shell waste

Area	Food & Pharmaceutical Industry, ETP
Uses	Agriculture, Food preservative, Drug delivery, Waste water treatment, Cosmetics etc

Picture: Chitosan Powder.

Chitosan is a cationic polysaccharide with linear chain consisting of β-(1,4)-linked 2-acetamino-2-deoxy-β-D-glucopyranose and 2-amino-2-deoxy-β-D-glucopyranose. It does not show any adverse effects when in contact with human cells and this property has attracted chemist's scientific attention to chitosan. The biological activities of chitosan make it promising agent in controlled drug delivery systems, which can control the release of drug for long period of time. Chitosan also has antimicrobial activity, wound-healing properties, and can decrease the level of cholesterol inhuman body

Scale of Development	The process is standardized at bench scale.
Major Raw Material	Shrimp processing waste (Head, body, Tail), Sodium hydroxide, Hydrochloric Acid.
Major Plant Equipment/Machinery	S.S.Still container, mechanical stirrer and hot plate.
Details of specific application	Drug excipient, Preservative, water treatment.
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
Commercialization Status	Ready for commercialization
Techono-Economics	Available on demand
Cost of Production	20000/Kg
Key wards	Chitin, Shrimp shell, Hydrochloric acid

Chemical Research Division
BCSIR Laboratories, Dhaka

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	S.S.Still container, mechanical stirrer and hot plate
Details of specific application	Heavy metal removal
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

Cotton seed oil

Uses	Crude cottonseed oil has been used in toiletries (e.g. Soaps, facial wash, shampoo and lotions) industries.
Scale of Development	The product is standardized at Bench scale.
Major Raw Materials	Waste cotton seed.
Major Plant Equipment	Distillation equipment,Heating mantle etc.
Specific Application	The main fatty acids found in crude cotton seed oil are palmitic acid,stearic acid,linoleic acid,caprylic acid,elaidic acid. Palmitic acid does display antioxidant properties. Also Palmitic acid can be used as surface active agents Caprylic acid is used in perfumary. Stearic acid is mainly used in the production of detergents, soaps and cosmetics such as shampoos and shaving cream products
Status of Development	It is developed and tested.
Environmental impact	Process is environment friendly.
Commercialization Status	Ready for commercialization
Price (per Litre)	100/- (One hundred taka only)
Key words	Waste cotton seed,toilatries,distillation etc.

Inventor: Dr. Shahin Aziz

Research Associates:
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Chemical Research Division
BCSIR Laboratories, Dhaka

Process	Production of Pectin from ripe mango peel
Area	Food and Pharmaceuticals
Uses	as gelling, thickening and stabilizing agent in processed food and excipient in pharmaceuticals
	Gelling agent, thickener and stabilizer

Ripe mango peel

Scale of Development	Laboratory scale
Major Raw Materials	Ripe Mango peel as wastes of mango processing industry, Ethanol (95%).
Major Plant Equipment/ Machinery	Drier, solvent distillation plant, grinder
Details of Specific application	Gelling agent in gam, gelly , marmalede etc. and excipient in pharmaceuticals
Status of Development	Product developed, analyzed and process ready to be leased out
Environmental Inpact	Not only environment friendly but also profitable as its raw material is a wastes of mango processing industry and it could be substitute of gelatin an animal tissue extract
Commercialized Status	Pectin is being imported still but there is a bright future for establishing this industry in our country
Cost of Production	around TK. 2 crore for 30 M.T. production per year
Key words	pectin, mango peel, gelling agent, thickener, stabilizer

Chemical Research Division
BCSIR Laboratories, Dhaka

Process	Production of Pectin from ripe jackfruit waste
Area	Food and Pharmaceuticals
Uses	as gelling, thickening and stabilizing agent in processed food and excipient in pharmaceuticals
	Gelling agent, thickener and stabilizer

Ripe jackfruit waste

Scale of Development	Laboratory scale
Major Raw Materials	Ripe Jackfruit rind (waste), Ethanol (95%).
Major Plant Equipment/ Machinery	Drier, solvent distillation plant, grinder
Details of Specific application	Gelling agent in gam, gelly , marmalede etc. and excipient in phamaceuticals
Status of Development	Product developed, analyzed and process ready to be leased out
Environmental Inpact	Not only environment friendly but also profitable as its raw material is a wastes of mango processing industry and it could be substitute of gelatin an animal tissue extract
Commercialized Status	Pectin is being imported still but there is a bright future for establishing this industry in our country
Cost of Production	Around TK. 5.5 crore for 30 M.T. production per year
Key words	pectin, jackfruit rind, gelling agent, thickener, stabilizer

Chemical Research Division
BCSIR Laboratories, Dhaka

Process	Production of Starch from ripe mango seed
Area	Food and Pharmaceuticals Industries and laboratory uses
Uses	As food additives and pharmaceutical excipients
	Thickener and stabilizer

Ripe mango seed

Scale of Development	Laboratory scale
Major Raw Materials	Ripe Mango seeds as wastes of mango processing industry
Major Plant Equipment/ Machinery	Drier, solvent distillation plant, grinder
Details of Specific application	• as thickening and stabilizing agent in foods such as puddings, custardsetc. • in the manufacture of various adhesives or glues for book-binding, wallpaper adhesives. • in the pharmaceutical industry, starch is also used as an excipient, as tablet disintegrant or as binder.
Status of Development	Product developed, analyzed and process ready to be leased out
Environmental Inpact	Not only environment friendly but also profitable as its raw material is a wastes of mango processing industry
Commercialized Status	Starch from discarded wastes of mango processing industries will obviously be profitable because we get valuable product with a very low cost
Cost of Production	Around TK. 34 lakh for 300 M.T. production per year
Key words	Starch, mango seed, thickener, stabilizer

Chemical Research Division
BCSIR Laboratories, Dhaka

Process	Production of oil from kernel of ripe mango
Area	Cosmetic Industries
Uses	useful in soap, shampoo, cream etc. manufacturing
	Cholesterol balance, Lowers blood sugar, Reduce acne, Maintain healthy weight (Ref: Health Benefit times.com)

Mango Seed Oil

Scale of Development	Laboratory scale
Major Raw Materials	Ripe Mango seeds as wastes of mango processing industry, nHexane
Major Plant Equipment/ Machinery	Soxhlet apparatus, solvent distillation plant
Details of Specific application	As an active ingredient in soap, shampoo, cream etc. manufacturing
Status of Development	Product developed, analyzed and process ready to be leased out
Environmental Inpact	Not only environment friendly but also profitable as its raw material is a wastes of mango processing industry and it could be substitute of mineral oil
Commercialized Status	Mango kernel oil is being imported but there is a bright future for establishing this industry in our country
Cost of Production	around TK. 59 lakh for 30 M.T. production per year
Key words	Mango kernel oil, cosmetic ingredient

Chemical Research Division
BCSIR Laboratories, Dhaka

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**

Anhydrous Aluminum Chloride

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.

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**

Chemical Research Division
BCSIR Laboratories, Dhaka

Process

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

Area	textile printing, dyeing, varnishesing
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 firearmsuppressors (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
Key wards	Lead oxide, acetic acid, textile, dye, vernish

Chemical Research Division
BCSIR Laboratories, Dhaka

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

Phosphate based fire extinguishing

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.

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

Chemical Research Division
BCSIR Laboratories, Dhaka

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 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.

Zinc Acetate

Scale of Development	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
Key wards	Zinc oxide, acetic acid, dietary supplement, lozenges.

Chemical Research Division
BCSIR Laboratories, Dhaka

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

Dry Chemicals (carbonate based) are one of the most widely used type of fire extinguisher that are effective mainly on Class B and C fires. This agent works by evolving carbon-dioxide and eliminates oxygen from fire and replacing it with carbon dioxide.

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
Key wards	Carbonate, fire, extinguisher, dry chemical

Plant Growth Regulator (PGR)

Major Raw materials:

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

Uses:

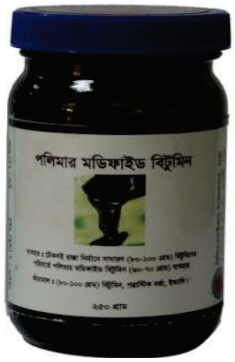
- It is used as a plant growth regulator in vegetables, fruit trees and tissue cultures to promote seed germination and to end the domant state of lateral buds.
- PGR aids in delaying the aging process of the plant, regulating the transport of nutrients, and promoting fruit formation.

BCSIR Laboratories Dhaka

Fiber and Polymer Research Division

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

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.

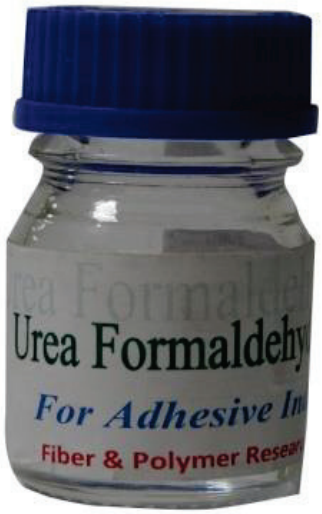
Demand: 20,000 MTs/Year.

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

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.

BCSIR Laboratories Dhaka

Fiber and Polymer Research Division

Water Soluble Curcumin Pigments

Major Raw materials: Turmeric, Food grade Solvent & Surfactant

Melting Point: 183ºC

Appearance: Bright Yellow to Orange Powder or Solution in Water.

Uses:

- Drug formulation as active ingredient
- Color for Food, Drug and Cosmetic
- As an Anti-oxidant
- As a Chemotherapeutic Agent
- As an Anti-inflammatory Agent

Salient Features:

- ✓ A simple process for the preparation of Food, Drug and Cosmetic grade water soluble curcumin pigments from turmeric powder.
- ✓ Water soluble curcumin pigment has great demand in local and international market.
- ✓ It has been prepared from locally available raw turmeric powder which will meet internal demand as well as will reduce import dependency.

BCSIR Laboratories Dhaka

Fibre and Polymer Research Division

Energy saving and low cost domestic oven
Industrial Physics Division
BCSIR Laboratories Dhaka

Product Name	 **Domestic Oven**
Major Raw Materials	Aluminum Sheet
Application	Without any extra fuel system, you can make your choice of **cakes, biscuits, pudding, bread, bunny, patties, roasted** and other delicious meals, in a healthier way. Uses of it are very safe and durable.
Usage	In the new condition, to remove the odor from the inside of the oven, put a small amount of gas stove in the lid, and cover the lid for 2 hours and take 1 hour of heat for the lid. You can control the heat by observing the oven with triangular hole. Do not raise the oven as soon as the blaze rings around the burner. It has been found that under this condition the temperature of 350-450 degrees Fahrenheit (175-232 degrees Celsius) is generated in the oven.
Advantages	A gas oven gives you greater control over your cooking temperature. Warm-up time is less with gas. Once you turn off the oven, cooking stops almost immediately. The instant on-off feature with gas cooking gives you complete freedom in good cooking. With electricity you need to allow some time for the oven to cool down. Some dishes may be affected by the prolonged high temperatures. Natural gas also cooks food more evenly than electricity. Gas ovens will give you better results in cooking.
Patent Details	**Bangladesh Patent No. 1002228(1989)**
Commercialization Status	Ready for Commercialization
Precaution	To make any type of food it is necessary to keep the ignition of the stove gentle. If heat becomes high the food can be burnt and the oven is likely to be damaged. The oven lid should not be open until the food is ready. Use handle cloth while holding hot hen. Clean the inside of the oven sometimes.
Techno-Economics	Available on demand
Ecological/Environmental Impact	It has no adverse effect on the environment
Keywords	Domestic, Food, Natural

BCSIR Laboratories, Dhaka

Pulp and Paper Research Division (PPRD)

1. Production of Conductive paper for electronics packaging

Process	Conductive paper for electronics packaging
Area	Electronics packaging
Uses	Packaging for electronics, circuit board
Salient Features	• Prohibition of bacterial growth • Protect from Dust particle
Scale of Development	Laboratory scale
Major Raw Materials	pulp
Major Plant Equipment/ Machinery	Polymerization tank, papermachine
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

2. Production of Activated Carbon

Process	Activated Carbon
Area	Adsorbent
Uses	Purification of Water, Cosmetics, medicine, gas purification, air filtration for mask
Salient Features	• 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

3. 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 • 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

4. Preparation of Rayon grade pulp

Process	Rayon grade pulp from lignocelluloses
Area	Rayon
Uses	Production of rayon and different chemicals
Salient Features	• 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

Digital Water Bath

Uses	To incubate samples in water at a constant temperature over a long period of time.
Features	✚ Provide greater temperature uniformity, control and stability. Working temperature range from Room Temperature to 100 °C ✚ Four holes. ✚ Heater: 2 kW ✚ Temperature stability of ± 0.2 °C ✚ Capacity: 8 liters
Scale of Development	The product is standardized at Bench scale.
Major Raw Materials	Stainless steel sheet, Thermocouple, IC, Relay, Heater etc.
Major Plant Equipment	Lathe machine, Sheet cutter, Circuit board plotter.
Specific Application	❖ Typically used during incubation in microbiological laboratory work. ❖ Warming Reagents/ Routine Laboratory applications ❖ Bacteriological Examinations ❖ Cell cultivation
Status of Development	It is developed and tested.
Environmental impact	Process is environment friendly.
Commercialization Status	Ready for commercialization
Price (per Unit)	45,000/- (Forty five thousand taka only)
Key words	Water bath, temperature, heater, sample

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Fruit-flavoured Salt for Gastric comfort

Process	: A process for production of fruit-flavoured salt which relieves discomforts due to food intake.
Area	: Gastric comfort, Relieves acidity.
Uses	: The granules according to the invention are especially advantageous in relieving gastric acidity instantly occurring due to food intake.
Salient Features	: The stomach naturally secretes acid that is essential to prevent bacterial growth and also to aid digestion of foods. When there is excess production of acid by the gastric glands of the stomach, it results in the condition known as acidity. Excessive acid in stomach may result from eating habits, fad diets, stress, smoking and alcohol consumption, lack of physical activity, irregularity in eating pattern etc. This may cause several discomforting situation like burning in the stomach and throat, restlessness, belching, nausea, sour taste, indigestion, constipation etc. The action of the acid neutralizing food supplements basically results in the increase of the stomach pH. Due to this increase in the pH value the symptoms typical of hyperacidity are reduced or even eliminated.
Scale of Development	: The process is standardized at bench scale.
Major Raw Materials	: Sodium Bicarbonate, Citric Acid, Tartaric Acid, Aspartame, Food Grade Color, Food Grade Essence.
Major Plant Equipment/Machinery	: Dryer, pH meter, Weighing machine, Moisture analyser.
Details of Specific Application	: The main object of the invention is to find out a suitable effervescent food supplement which can relieve the symptoms of occasional gastric acidity defined herein as sour stomach, upset stomach, acid indigestion, belching, abdominal pain, heartburn, bloating, gas etc. with a pleasant taste on ingestion.
Status of Development	: The product has been developed and leased out to the local entrepreneur “M/S Grand Consumer” of Pabna.
Ecological/Environmental Impact	: The developed process is environment friendly. All raw materials used in the process are nontoxic. None of the consumables or procedures has adverse impact on ecology or environment.
Commercialisation Status	: Leased out to M/S Grand Consumer, Village: Fakirpoor, Post office: Malanchi, Upazila: Pabna Sadar, District: Pabna.
Price	10/- per 5 gram
Key words	: Fruit-flavoured salt, Gastric comfort, Food intake.