

1. Production of Ceramic Stain



Introduction:

We use porcelain crockeries and decoration piece in our house. If we draw various design on the body of porcelain crockeries and decoration pieces, it will be very beautiful and lucrative.

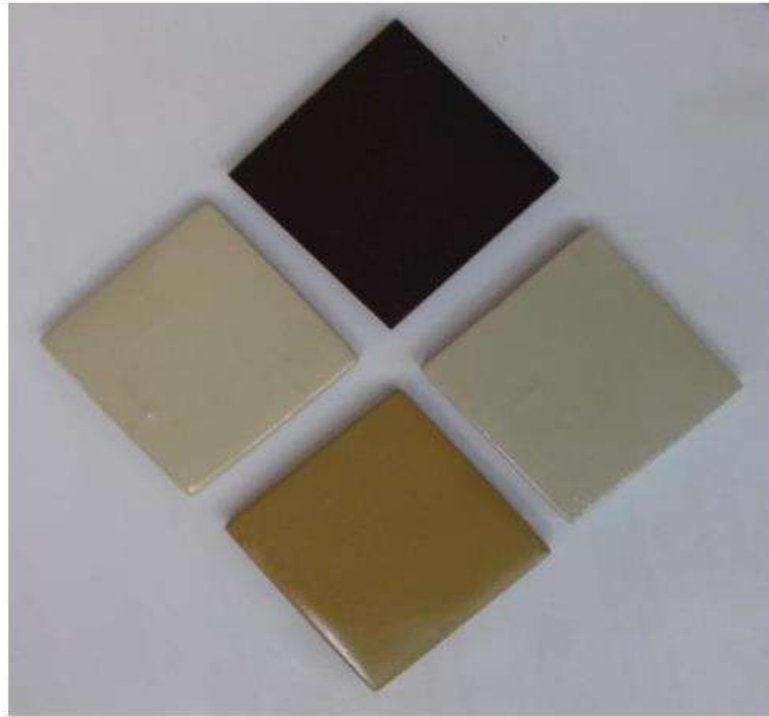
Raw materials:

various metal oxides

Description:

Ceramic stain is used in porcelain bodies which are made using various metal oxides with firing. The prepared stain is cost effective and environmental friendly. Ceramic stain is used to apply color in porcelain materials and decoration of ceramics.

2. Glass- Ceramic Tiles



Introduction:

The Process is used for production of glass ceramic which is used to cover the floor, wall and facade of building.

Raw materials:

Rice Husk Ash, Fly Ash, Waste Iron, K-feldspar and Waste glass, (Soda lime).

Description:

Rice Husk Ash, Fly Ash, Waste Iron, K-feldspar and Waste glass, (Soda lime) are used to produce glass ceramic tiles.

3. Shawdesh Household Arsenic Removal Filter



Introduction:

Arsenic contaminated water are prevailed over maximum village area of Bangladesh specially in North Bengal area. In order to remove Arsenic contamination from drinking water Shawdesh Household Arsenic Removal filter can be used.

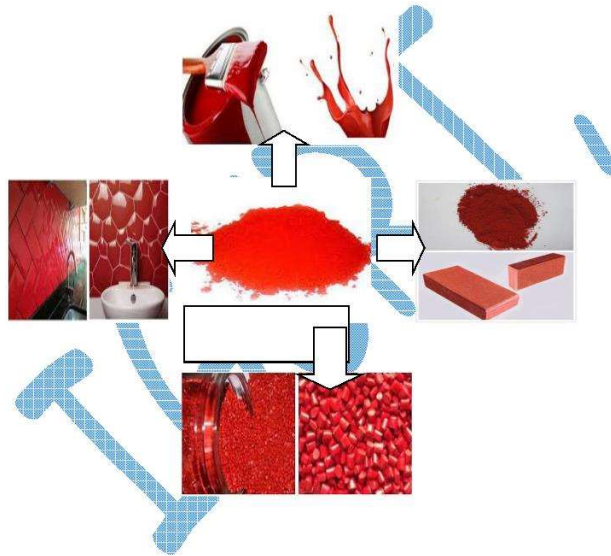
Raw materials:

2 buckets, bucket stands and oxidizing agent.

Description:

Arsenic contaminated water poured into the bucket. Required amount of oxidizing agent mixed with it, and then it is vigorously stirred. Then it is settled for an hour. The process is an efficient technique for removal of arsenic and can be applied in both domestic as well as at community level as it requires no electricity.

4. Low cost red oxide from mill-scale



Introduction:

The wastage mill-scale is the flaky outer surfaces of plates, sheets or profiles when they are being produced by rolling red hot iron or steel billets in rolling or steel mills.

Production process:

In this project, the flaky outer surfaces of plates, sheets or profiles of the re-rolling steel mill is converted to powder (granular particles) by special machine and become red oxide at low cost.

Application:

Red oxide is most commonly used with cement for flooring with red color. It is widely used in all kinds of paints, such as house paints, floor paints, stains, enamel etc. It is also used as a pigment in tiles, floor tiles, flooring products, ceramics, pottery, undercoat & powder coating and others. The demand of Red Iron Oxide pigment in Bangladesh is nearly 3000 MT per year.

5. Production of zinc oxide from zinc dust



Introduction:

Huge amount of zinc dust is producing from galvanizing industry as by-product during drying the metal sheet or rod by hot air after galvanizing. These huge amount of zinc dust can be used for zinc oxide production.

Production process:

1. Zinc is leached out with various acid.
2. Removing impurities from the production.
3. Finally, zinc is precipitated and converted to zinc oxide

Application:

Zinc oxide has many applications in Pigments, Paints, Plastic & Rubber Industry, Textile industry and Tiles & Ceramic Industry. It is also used in photo catalysis, electronic and electro technology industries. The demand of zinc oxide in Bangladesh is over 10,000 Tons per year.

6. Production of Zinc Sulfate from Zinc Ash



Introduction:

A total of 128 rolling mills are currently running in Bangladesh, which are producing a large amount of zinc ash as a waste materials.

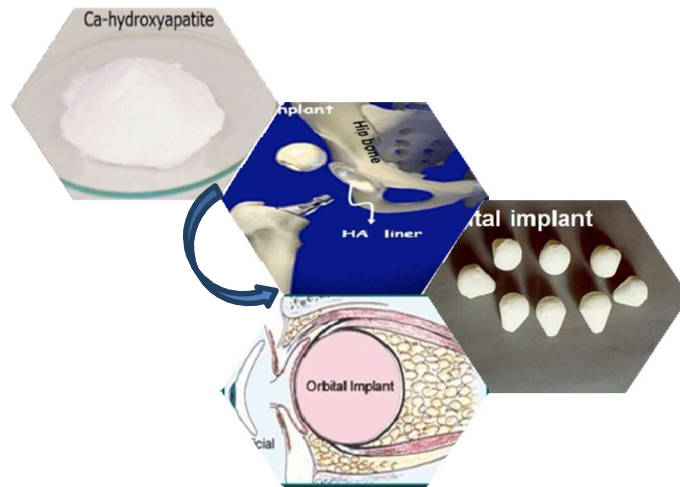
Production process:

1. Zinc is extracted from zinc ash with acid.
2. Then the solution is neutralized by applying alkali.
3. Finally, the solution is concentrated and crystallized as zinc sulfate.

Application:

Zinc sulfate (ZnSO_4) is used as a coagulant in the production of rayon. It is used to supply zinc in the animal feeds, fertilizers and agricultural sprays. It is also a precursor to the pigment lithopone and also used as mordant, analytical reagent, electrolytes for zinc plating, mordant in dyeing, preservative and in paint and varnishes and so on.

7. Production of Ca-hydroxyapatite (HAP)



Application of Ca-hydroxyapatite (HAP) widely used as bio-ceramic material

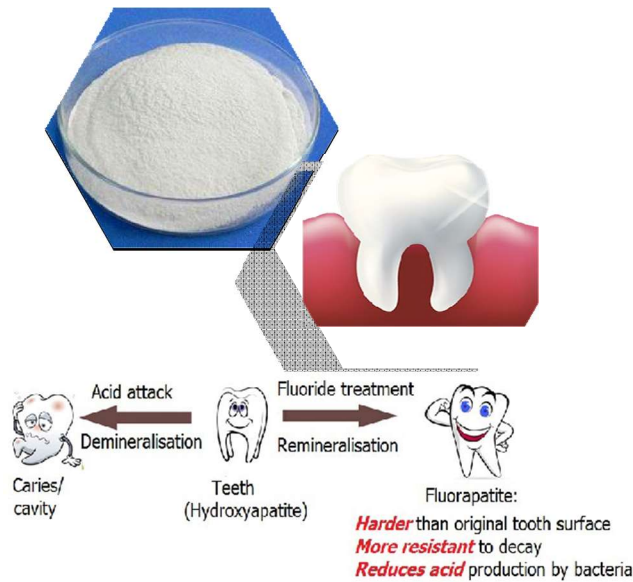
Salient Feature:

Calcium Hydroxyapatite [HAP $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$] plays an important role in biomedical field because of its chemical similarity to bone. Hydroxyapatite is a highly biocompatible material which is being used for coating on metallic implants, as a porous ceramic that favors bone ingrowths, to fill small bone defects & for tissue engineering scaffolds.

Specific application:

HAP is being used as a biomaterial in various applications (e.g., artificial bone and dental root, cosmetic foundation, *etc.*).

8. Production of Fluoroapatite (FHA)



Description:

Fluoroapatite (FHA)- is being used in dentistry field due to its extensive performance in preventing dental carries.

Salient Feature:

Demand of fluoroapatite (FHA) is increasing day by day and so far we know that in our country, FHA is being imported which costs lot of foreign exchange. Considering these facts, a process has been developed to prepare fluoroapatite using waste eggshell as the prime source of calcium.

Main ingredient: Eggshell

Specific application:

FHA is being used in dentistry field due to its extensive performance in preventing dental carries.

9. Production of Superplasticizer



Description: Superplasticizer- a water soluble resin widely used as an admixture to enhance the fluidity of concrete.

Salient features:

- Higher workability
- Enhance strength
- Increase durability
- Resist corrosion

Specific application:

Superplasticizer plays a positive role in maintaining high fluidity of concrete. Applications are very much important to the production of high performance concrete (HPC).

10. Preparation of low cost transparent glaze



Description:

Low cost transparent glaze can be prepared for the decoration of earthenware body (pottery). Such as tree plantable tub, flower vessel and show piece made of clay can be decorated by low cost transparent glaze. This low temperature transparent glaze can be used by the potters to enhance the strength and beauty of the products.

Salient Feature:

- It enhance the strength of the products.
- It enhance the beauty of the products.
- This glaze is environment friendly.
- It is lead and cadmium free.

11. Production of ceramic red brown stain



Description:

Red brown stain can be prepared for the decoration of ceramic ware body (pottery). Such as flower vessel and show piece made of ceramic can be decorated by red brown stain. Ceramic products are decorated with various ceramic stains to make it attractive as well as to increase the market value.

Salient Feature:

- It enhance the beauty of the products.
- Red brown stain is environment friendly.
- It is lead and cadmium free.

12. Long life Treated Bamboo

(Preservation of Bamboo by chemical treatment)



Description:

Longevity of normal bamboo is 1 to 3 years but it can be rises around 50 years by chemical treatment.

Preservation process of Bamboo:

- In this process, the raw bamboo is put in a chemical mixture for 8 days.
- Then the bamboo is dried in sunlight.

Application:

- After proper drying this bamboo can be used in nonstructural construction like Hut
- Low cost building materials
- Furniture
- Showpiece etc.

13. Energy Efficient brick



Description:

Here industrial waste is utilized for production of energy efficient brick. It saves near about 200°C temperature from conventional brick firing temperature.

Production process:

- In this process glass waste (Cullet) and red clay is mixed in the proper ratio.
- Then fired at a certain temperature to make brick.

Salient Feature:

- The produced brick from this process can gain high compressive strength and energy efficiency.
- It saves approximately 50% clay from conventional brick.
- It has higher compressive strength than conventional brick.
- It is eco-friendly and cost effective.

Application:

- Structural construction.
- Low cost building materials.

14. Production of Roof Tiles



Description:

Production of Roof Tiles from locally available raw materials.

Production process:

- Roof tiles can be made by any locally available clay and rice husk ash or fly ash.
- Then fired at a certain temperature to make brick.

Salient Feature:

- It would be low cost building materials.

Application:

- It is used in semi-pucca houses of rural areas and urban housing.
- Uses as a building material (protecting the roof of a house from weather damage).

Source: BCSIR