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***Course code- ICH360***

***Course Title- Glass blowing practical***

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Answers to assignment

1. Annealing is a heat treatment process used mostly to increase the ductility and reduce hardness of a material
2. Furnace, Annealer, Bench, Block, Blowpipe, Glory hole, Jack, Marver, Mold, Optic mold, Paddles.
3. Silicate glass, Soda lime glass, Borosilicate glass, Lead glass
4. Glass are transparent

Glasses are fire resistant

It can be blown, drawn and pressed to any shape, color and variety

Glass is an excellent insulator against heat, electricity and electromagnetic radiation

Glasses can withstand the effect of chemical reaction under different environmental conditions.

1. Industrial glass melting in tank furnaces involves transfer of heat required for the fusion of the batch material and to obtain a low viscous melt. The heat transfer process to the melt in fossil-fuel-fired furnaces is dominated by the radiation from the combustion chamber to the batch blanket and to the glass melt surface
2. Heating

Primary Melting

Fining and Homogenization

Redox state of glass

Conditioning

1. Soda lime glass- It is used in making dinner wares, bulbs, bottles and jars.

Borosilicate glass- Borosilicate glass has a wide variety of uses ranging from cookware to lab equipment. It is also used as pipe coolant (often distilled water) through high power vacuum turn-based electronic equipment.

1. Sodium oxide is usually added to lower the melting temperature of the sand (over 1700C)
2. Borosilicate glass is created by combining and melting boric oxide, silica sand, soda ash and alumina. Since borosilicate glass melts at a higher temperature than ordinary silicate glass some new technique were required for industrial production.
3. Carbon dioxide, Nitrogen Oxide, Sulfur dioxide, Carbon monoxide, Silicon dioxide
4. Cadmium Sulfide- Yellow

Gold chloride- Red

Cobalt oxide- Blue violet

Manganese Dioxide- Purple

Nickel Oxide- Violet

1. Industrial Glass co

Illinois Glass co

Owen’s Illinois Glass co

Indiana Bottle & Glass co

Dominion Glass co

Imperial Glass co

Independent Glass co

Intermountain Glass co

Consumers Glass co

Keen Glass Works

Iroquois Glass co

1. They are used for making laboratory equipment

They are used in making scientific lenses and hot mirrors

They are used in making bakeware and cookware

They are used in making high intensity lighting product

They are used in making aircraft exterior lenses.