

Study of glass as material for container

Ms. Shubhashree Das

Assistant Professor

School of Pharmacy

Centurion University of Technology and Management

Balasore

shubhashree.das@cutm.ac.in

TYPES OF PACKAGING MATERIALS USED FOR PHARMACEUTICAL PACKAGING

- Glass
- Plastics
- Rubbers
- Paper/card boards
- Metals

GLASS:

Glass has been widely used as a drug packaging material

Advantages

- They are transparent.
- They have good protection power.
- They can be easily labelled.
- Economical
- Variety of sizes and shapes
- They can withstand the variation in temperature and pressure during sterilization.
- They do not deteriorate with age.

Disadvantages

- Glass is fragile so easily broken.
- Release alkali to aqueous preparation

COMPOSITION OF GLASS

- Sand (silicon dioxide) Soda ash (sodium carbonate) Limestone (calcium carbonate) Cullet (broken glass) - aluminium, boron, potassium, magnesium, zinc, barium,
- Amber: light yellowish to deep reddish brown, carbon and sulphur or iron and manganese dioxide
- Yellow: Compounds of cadmium and sulphur
- Blue: Various shades of blue, cobalt oxide or occasionally copper (cupric) oxide
- Green: iron oxide, manganese dioxide and chromium dioxide

TYPES OF GLASS

- Type I—Highly resistant borosilicate glass
- Type II—Treated soda lime glass
- Type III—soda lime glass
- NP—soda glass (non parenteral usage)

Type I-borosilicate glass

- Alkalinity is removed by using boric oxide to neutralized the oxide of potassium and sodium
- It is highly resistant glass.
- It has high melting point so can with stand high temperatures.
- It is more chemically inert than the soda lime glass
- It can resist strong acids, alkalies and all types of solvents. Reduced leaching action.

USES:

- Laboratory glass apparatus.
- For injection and water for injection.

Type II-treated soda lime glass

- Type II containers are made of commercial soda lime glass that has been de-alkalized or treated to remove surface alkali .
- The de-alkalizing process is know as sulphur treatment.
- Sulphur treatment neutralizes the alkaline oxides on the surface, rendering the glass more chemically resistant.

Uses:

- Used for alkali sensitive products.
- Infusion fluids, blood and plasma. Large volume container.

CHARACTERISTICS OF PACKAGING MATERIAL

The material selected must have the following characteristics:

- Must meet tamper-resistance requirements
- Must be FDA approved
- Must be non-toxic
- Must not impart odor/taste to the product
- Must not reactive with the product
- They must protect the preparation from environmental conditions

Type III—soda lime glass

- Containers are untreated are made of commercial soda lime glass of average or better than average chemical resistance.
- It contains high concentration of alkaline oxides and imparts alkalinity to aqueous substance

Uses

- Used for all solid dosage form
- For oily preparation

NP—soda glass (non parenteral usage)

- Containers are made up of soda lime
- Glass supplied for non-parenteral product intended for oral to topical use.