

Glass Containers, Classification of Their Composition, Characteristics

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Abstract: In this article, the composition, classification, properties of glass containers were studied in depth and the results were highlighted.

Key words: glass container, composition of glass, functionality, characteristic of glass.

Glass refers to all amorphous bodies that are formed by cooling a heated and liquefied substance, regardless of solidification, liquefaction temperature and chemical composition, and exhibiting the properties of a solid body, in which the process of transition from a liquid state to a glass state must be reversible.

The composition of the bottle

Glass mainly consists of silicon oxide (59-80%), with varying degrees of calcium oxide (5-12%), sodium oxide (12-17%), aluminum oxide (0.5-3.0%), boron oxide, boric oxide, potassium oxide. and magnesium oxide. The high melting point of glass is due to the presence of silicon oxide. The melting point of the glass and the viscosity of the solution are changed by the addition of oxides. Glass is usually brittle and transparent. When glass is heated, it does not liquefy and harden in a certain way like crystalline substances, but gradually changes from a solid state to an elastic soft state and finally to a liquid state.

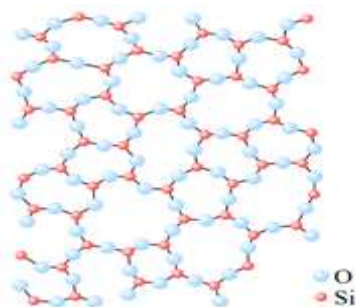


Figure 1



Figure 2

Figure 1. Two-dimensional amorphous structure of silicon dioxide (SiO_2). Although there is local order relative to the tetrahedral arrangement of oxygen atoms (O) around the silicon atoms (Si), there is no long-range order.

Figure 2. A coded symbol indicating that the glass is recyclable

Glass container is one of the widely used containers in food, medicine and chemical industries. They have good chemical stability, easy sealing, good air permeability, transparency and can be monitored from the outside; ease of storage; surface smoothness, easy to disinfect and sterilize; beautiful appearance, rich decoration; a certain mechanical strength can withstand the pressure in the bottle and the external force during transportation; The advantage of the glass container is the possibility of wide distribution of materials and low cost. Its disadvantages are the fragility of the dishes.

Glass products for the kitchen are classified according to a number of criteria.

• According to its purpose, it is divided into a dining room, an economic room, often adding a kitchen and tea and coffee rooms.

- Functionality: for preparing various dishes, storing and serving food, receiving food and various drinks.
- By type of glass: plain material, crystal, heat resistant.
- According to the method of creation: pressed containers, blown and pressed products, as well as enameled ones.
- By name
- With the presence of decor.
- In shape - can be hollow or flat.
- By size: small items, medium and large, plus large samples.
- By completeness: device or pair, package or service, large package.
- Glass containers are divided into the following according to the type of raw material:
 - made of heat-resistant glass;
 - simple glass containers.

№	The color of the glass container	The color of the glass container
1.	Amber (brown) glass	Glass has a brown color due to the addition of sulfur, iron and carbon. Such glass provides optimal protection for light-sensitive formulas and cosmetic components - drinks, many drug groups, oils.
2.	Cobalt (blue) bottle	The blue color of the glass is due to the addition of cobalt oxide or copper oxide, which absorb ultraviolet radiation but transmit the blue spectrum
3.	Black bottle	Black glass is similar in properties to brown glass, in addition, it blocks light in the visible range and passes only infrared radiation. The UV barrier makes it possible to preserve the beneficial properties of cosmetics, cosmetics and medicinal preparations, especially natural and organic ones, for a longer time, while reducing the required amount of preservatives to a minimum.
4.	Green bottle	The classic green color is obtained by adding chromium oxide. Green glass has a more decorative look. Like transparent, it transmits the entire range of sunlight.
5.	Purple bottle	It acts as a natural filter against the radiation of the visible spectrum, and also allows the passage of a minimum dose of UVA (25-45%) and infrared rays (up to 60%).
6.	Decorative colored glass	Since the paint covers only the outer side of the container walls, the glass retains its chemical neutrality and its chemical composition is absolutely safe. A colored layer can also provide the same light barrier with the addition of iron, cobalt and other "inside" paints.

Conclusion: When glass containers, i.e. crystals, are used for food products, it is necessary to use them knowing their composition and properties, it was found out as a result of research that it is harmful to store food products that come into contact with the containers for a long time in glass containers.

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