

Ceramics and Glass Technology (Silicate Glasses, Boric Oxide and Borate Glasses, Phosphorus Pentoxide and Phosphate Glasses, Germanium Dioxide and Germanate Glasses, Nitrate Glasses, Halide Glasses, Chalcogenide Glasses, Modern Glass Working, Monax and Py

Description:

Glass-ceramics are mostly produced in two steps: First, a glass is formed by a glass-manufacturing process. The glass is cooled down and is then reheated in a second step. In this heat treatment the glass partly crystallizes. In most cases nucleation agents are added to the base composition of the glass-ceramic. These nucleation agents aid and control the crystallization process. Glass-ceramics are fine-grained polycrystalline materials formed when glasses of suitable compositions are heat treated and thus undergo controlled crystallization to the lower energy, crystalline state. It is important to emphasize a number of points in this statement on glass ceramics.

Technavio's market research analyst predicts that the glass ceramics market will grow at a modest CAGR of just over 6% during the forecast period. Glass ceramics have helped the electronics industry build much smaller and highly efficient transistors, leading to advances in all types of devices. Ceramic devices and implants are also very much in demand by the medical industry. A number of surgeons prefer to use ceramic implants as they are very strong, resistant to corrosion and also bio-compatible.

Ceramic materials are widely used in building projects in commercial and industrial sectors as these materials effectively help reduce sound and are cost-effective compared to other materials. The glass ceramics of the $\text{CaO-Al}_2\text{O}_3\text{-SiO}_2$ systems show promise as construction materials. They are used for abrasion and chemically resistant parts or floor and wall tile in the chemical, mechanical, construction as well as heavy industries.

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