BPA-free unsaturated monomers and oligomers having low viscosities

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Technology description

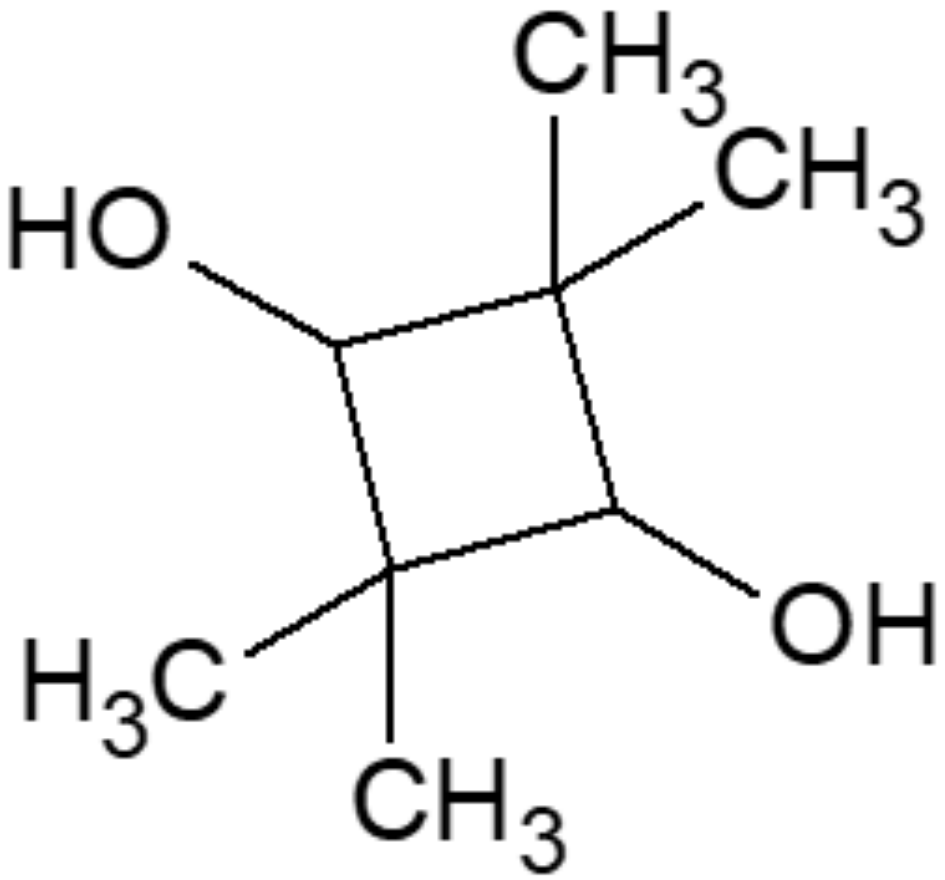
Background

Americans between the ages of 20 and 64 have an average of 17.31 fillings on their teeth. These very common procedures can be carried out using gold, silver, porcelain, or composite resin. While each has their pros and cons, composite resin has the best potential for growth, as many different compounds can be created depending on the tooth, and the color of the filling can perfectly match your other teeth.

Composite resin has been continuously produced using bis-GMA monomers since their inception in the 1960′ s. This composite has its benefits, but ultimately yields bisphenol-A (BPA) after extended time in wet conditions, such as the mouth. Currently, there is a growing concern over the health risks associated with the BPA resin, increasing demand for safer substitutes in all of its applications. While the proposed methods of replacing the resin do address the BPA concerns, they introduce the need for diluents that can be equally as harmful.

Technology

Professor Daniel Schmidt and his teams have discovered that an alternative epoxy to BPA can be used to create the desired composite for dental applications. Using specific compounds of cyclobutanediol (CBDO) epoxy rather than the currently used BADGE has shown to improve the versatility of dental applications while decreasing the need for diluents such as Styrene. CBDO was developed by Schmidt and his team as a drop-in replacement for any BPA ridden products. The synthesis of this novel bis-GMA-CBDO composite has been completed successfully with further analysis showing its performance advantages over conventional bis-GMA resin.



CBDO

With the growing awareness of health risks associated with BPA products, this technology can be easily integrated into dental markets worldwide to alleviate consumer’ s concerns and mitigate the risks involved with synthetic resin fillings.

Publications

https://www.uml.edu/News/press-releases/2013/BPA%20research.aspx
https://patents.google.com/patent/US9434867B2/en?oq=9434867

Application area

The global composite fillings market is projected to grow at a healthy CAGR of 4.8% over the next four years to reach an estimated $509.1 Million by 2022.

· Dental sealants and composites
· Fiber composites
-Vinyl Ester Resin
-Unsaturated Monomers and Oligomers
· Industrial coatings

Advantages

· BPA-free material
· Lower viscosity than currently used sealants and composites
· No use of styrene
· User friendly
· More additional fillers can be included to increase mechanical performance
· Enhanced UV transparency
· No aromatic ring
· Improved curing process

Institution

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