Catechol-Thiol-based Protein Glue inspired by Underwater Mussel Redox Chemistry for Dental Resin Formulation

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Mussels are effectively operated by creating an acidic environment when adhering with 3,4-dihydroxy-l- phenylalanine (DOPA)-thiol redox chemistry for underwater bonding. Similarly, in dental adhesives, phosphoric acid-based etching is used for dentin-bonding materials. In view of the similarity between dental adhesives and underwater mussel adhesives, the combination of DOPA and thiol chemistry with acid etching can be used to overcome one of the most critical issues in dentin medical adhesives. The proposed adhesion method produces high adhesion strengths compared to those currently used in dentin and zirconia adhesives. Here, we extend and evaluate dentin and zirconia dental adhesives by mixing with mussel (DOPA)-thiol redox chemistry and acid etching.