Water-Compatible Dentin Adhesives with Esterase Resistance

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Technology description

The invention is a new dentin adhesive that has a high tolerance to water and enhanced resistance to esterase degradation that could increase the clinical lifetime of restorative composites.

Overview

The use of restorative composites in dentistry has been driven by esthetic features and the public’ s concern about mercury release from dental amalgam. Although there is great demand for dentin adhesives that are mercury free, current mercury free adhesives on the market exhibit a short clinical lifetime due to the presence of water and enzymatic degradation in the mouth. The primary factor in the premature failure of composite restorations is recurrent caries at the margins of these restorations. Recurrent decay is most often localized gingivally and is linked to the lack of consistent seal at the tooth/material interface. Water in the mouth is a major interfering factor when bonding adhesives and/or composites to the tooth. Effective bonding at the prepared tooth/composite material interface requires dentin adhesives that provide superior properties and rapid polymerization under clinical conditions.

Application area

The monomer can be used in dental composite restorative materials, pit and fissure sealants, and adhesive resin cements for dentistry.

Advantages

The new methacrylate based dentin adhesive uses a new monomer which has shown improved resistance to esterase degradation without compromising other physical properties such as degree of

conversion, adhesive penetration and thermal and mechanical properties. The monomer was designed to have better biodegradation performance in the moist environment of the mouth.

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