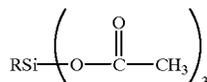


and



the resins can have unique adhesive properties. Representing a marriage of acrylic and silicone chemistries, the synthesis of these novel hybrid resins typically involves only one step and employs readily available reactants. Many of the self-adhesive resins can be utilized as coupling agents for siliceous and other fillers, and as the organic matrices of thermoset composites. Their unique structural characteristics lend themselves to the preparation of condensable dental composites characterized by enhanced strength and durability compared to currently available composites. These novel resins also can be designed to have minimal polymerization shrinkage, low water sorption, and excellent adhesion to glass and similar substrates.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects, features, and advantages of the present invention will become more fully apparent from the following detailed description of the preferred embodiments, the appended claims, and the accompanying drawings. As depicted in the attached drawings:

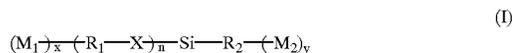
FIG. 1 is a plot of the relative OH content of the Bis-GMA product versus the mole ratio of the MPTMS/Bis-GMA reactant charge expressed as the ratio of SiOCH₃/OH.

FIG. 2 shows the infrared spectra, absorbance versus wavenumber, for Bis-GMA, MPTMS, and the reaction product for a mole proportion of 1.5 Bis-GMA and 1.0 MPTMS.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

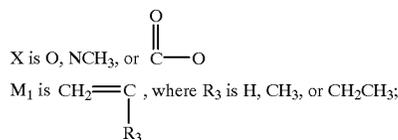
The present invention will be disclosed in terms of the currently perceived preferred embodiments thereof.

The present invention provides a silylated resin represented by the general formula (I):

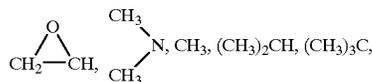


in which:

- R₁ is an aliphatic, cycloaliphatic, aryl, hydrocarbon, or fluorocarbon group;
- R₂ is the same as R₁ or a different aliphatic, cycloaliphatic, aryl, hydrocarbon, or fluorocarbon group;

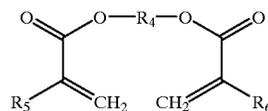


M₂ is the same as M₁ or a different functional or non-functional group selected from the group consisting of



- CF₃, and C₆H₅;
- n is 1-3;
- x is 1-20; and
- y is 1-20;

which comprises the reaction product of the exchange reaction of a hydroxylated, aminated, or carboxylated acrylic resin represented by the general formula (II):



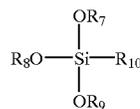
in which:

R₄ is an aliphatic, cycloaliphatic, aryl, hydrocarbon, or fluorocarbon group with one or more protic functional groups selected from the group consisting of:

- OH, N-H, and CO₂H

- R₅ is H or CH₃; and
- R₆ is H or CH₃;

with a trialkoxyorganosilane or triacyloxyorganosilane represented by the general formula (III):



in which:

R₇, R₈, and R₉ each is:

- CH₃, CH₃CH₂, CH₃CH₂CH₂, (CH₃)₂CH,

