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Development of Dental Composite Resin Utilizing Low-shrinking and Low-viscous Monomers

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Abstract:
To lower the viscosity of composite resins, experimental composite resins were produced using low-viscosity monomer mixtures of newly developed polyfunctional acrylates, and the mechanical and physical properties of the hardened composites were investigated. Mechanical (*i.e.*, compressive, diametral tensile, and bending) strength of a polymer obtained from one new monomer mixture without fillers was similar to that of a bis-GMA/ TEGDMA (2/ 1 weight ratio) based polymer. As for the hardened composites, the mechanical strength of composites produced using the new monomer mixtures showed a different tendency from that of bis-GMA based composites. Further, even the viscosity of composite pastes with high filler content was markedly lower than that of bis-GMA based composites. In terms of setting shrinkage, the composites consisting of new monomer mixtures exhibited significantly smaller shrinkage than the bis-GMA based composites, and decreased with increase in filler content.

Key words:
Composite resin, Urethane monomer, Curing shrinkage

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