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[\[Image PDF \(407K\)\]](#) [\[References\]](#)**Degradation of Methacrylate Monomers in Human Saliva**[Maki HAGIO<sup>1\)</sup>](#), [Minoru KAWAGUCHI<sup>2\)</sup>](#), [Wataru MOTOKAWA<sup>1\)</sup>](#) and [Koji MIYAZAKI<sup>2\)</sup>](#)

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**Abstract:**

This study assessed the effect of the molecular structure of newly synthesized methacrylate monomers on their chemical stability in human saliva, whereby these monomers can be used as dental composite resins. Six model monomethacrylates and two urethane-modified BisGMA monomers were added to human saliva, and their change in concentration after 24, 48, and 72 hours were measured by high-performance liquid chromatography. Degradation of the six model monomethacrylate monomers was found to be influenced by the molecular structure, such as steric hindrance and presence of urethane bond in chemical backbone. Based on the degradation test results of these six monomers, urethane-modified BisGMA derivatives — in which the hydroxyl groups in original BisGMA monomer were substituted with alkyl isocyanate — were synthesized and subjected to degradation test. The urethane-modified BisGMA monomers showed a particular resistance to salivary hydrolysis. Results of this study thus suggested that urethane groups should be considered when designing new monomers for dental composite systems as they demonstrated improved resistance to hydrolysis.

**Key words:**[Monomer](#), [Degradation](#), [Saliva](#)

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