

Author: [ADVANCED](#)

Volume Page

Keyword: [TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

ONLINE ISSN : 1881-1361

PRINT ISSN : 0287-4547

Dental Materials Journal

Vol. 29 (2010) , No. 5 p.481-501

[\[PDF \(2377K\)\]](#) [\[References\]](#)**A review of the development of radical photopolymerization initiators used for designing light-curing dental adhesives and resin composites**[Kunio IKEMURA](#)¹⁾ and [Takeshi ENDO](#)²⁾

1) Department of Research and Development, Shofu Inc.

2) Molecular Engineering Institute, Kinki University

(Received December 24, 2009)

(Accepted April 30, 2010)

Abstract:

This paper reviews our recent studies on radical photopolymerization initiators, which are used in the design of light-curing dental adhesives and resin composites, by collating information of related studies from original scientific papers, reviews, and patent literature. The photopolymerization reactivities of acylphosphine oxide (APO) and bisacylphosphine oxide (BAPO) derivatives, and D,L-camphorquinone (CQ)/tertiary amine were investigated, and no significant differences in degree of conversion (DC) were found between BAPO and CQ/amine system ($p > 0.05$). In addition, a novel 7,7-dimethyl-2,3-dioxobicyclo[2.2.1]heptane-1-caronyldiphenyl phosphine oxide (DOHC-DPPO=CQ-APO) was synthesized and its ultraviolet and visible (UV-VIS) spectral behavior was investigated. CQ-APO possessed two maximum absorption wavelengths (λ_{\max}) at 350–500 nm [372 nm (from APO group) and 475 nm (from CQ moiety)], and CQ-APO-containing resins exhibited good photopolymerization reactivity, excellent color tone, relaxed operation time, and high mechanical strength. It was also found that a newly synthesized, water-soluble photoinitiator (APO-Na) improved adhesion to ground dentin.

Key words:[Radical photopolymerization](#), [Photoinitiator](#), [Light-curing dental adhesive](#)[\[PDF \(2377K\)\]](#) [\[References\]](#)Download Meta of Article [\[Help\]](#)

To cite this article:

Kunio IKEMURA and Takeshi ENDO. A review of the development of radical photopolymerization initiators used for designing light-curing dental adhesives and resin composites . Dent. Mater. J. 2010; 29: 481-501 .

doi:10.4012/dmj.2009-137

JOI JST.JSTAGE/dmj/2009-137

Copyright (c) 2010 The Japanese Society for Dental Materials and Devices

[View "Advance Publication" version \(September 16, 2010\).](#)



[Japan Science and Technology Information Aggregator, Electronic](#)

