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[\[PDF \(795K\)\]](#) [\[References\]](#)**UV-VIS spectra and photoinitiation behaviors of acylphosphine oxide and bisacylphosphine oxide derivatives in unfilled, light-cured dental resins**[Kunio IKEMURA](#)¹⁾, [Kensuke ICHIZAWA](#)¹⁾, [Mariko YOSHIDA](#)¹⁾, [So ITO](#)¹⁾ and [Takeshi ENDO](#)²⁾³⁾

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Abstract:

The aims of this study were to investigate the photoinitiation behaviors of acylphosphine oxide (APO) and bisacylphosphine oxide (BAPO) derivatives in comparison to D,L-camphorquinone (CQ)/tertiary amine (EDAB) system. Fifty six kinds of experimental unfilled, light-cured resins were prepared using APO, BAPO, CQ, EDAB, resin monomers, and adhesive monomers. The measurements of ultraviolet-visible (UV-VIS) spectroscopy, photopolymerization with differential scanning calorimeter (photo-DSC) and degree of conversion (DC) determination were performed. Results showed that the UV-VIS spectra of all APO and BAPO derivatives possessed λ_{\max} ranging between 365 and 416 nm. Their photoinitiation behaviors were not influenced by acidic adhesive monomers formulated in unfilled Bis-GMA-based resins ($p < 0.05$). Although BAPO exhibited higher reactivity than CQ/EDAB in unfilled 6-methacryloyloxyhexyl phosphonoacetate (6-MHPA)/ 2-hydroxyethyl methacrylate (HEMA) and 6-MHPA/glycerol monomethacrylate (GM)-based resins, it was found that there were no statistically significant differences in DC (%) between BAPO [44.2(6.5)–51.2(4.3)] and CQ/EDAB [42.4(4.4)–47.5(3.7)] ($p < 0.05$). It was concluded that APO and BAPO photoinitiators exhibited reactivity comparable to that of

CQ/tertiary amine system.

Key words:

[UV-VIS spectra](#), [Photo-DSC](#), [Degree of conversion](#)

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