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Flexural properties of ethyl or methyl methacrylate-UDMA blend polymers

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Abstract:
Light-curing polyethyl methacrylate (PEMA)-urethane dimethacrylate (UDMA) resins and polymethyl methacrylate (PMMA)-UDMA resins were prepared by two processes. For first step, PEMA or PMMA powders were fully dissolved in ethyl methacrylate (EMA) or methyl methacrylate (MMA) and then the PEMA-EMA/PMMA-MMA mixtures were mixed with UDMA. The flexural properties of cured PEMA-UDMA and PMMA-UDMA polymers were measured using two PEMA (Mw: 300,000–400,000 and 650,000–1,000,000) and three PMMA (Mw: 30,000–60,000, 350,000 and 650,000–1,000,000) powders with different molecular weight, four mixing ratios of PMMA-MMA, and three mixing ratios of PMMA-MMA mixture and UDMA oligomer. Polymers with PMMA(Mw: 350,000) MMA=25/50, and with PMMA(Mw: 350,000)-MMA/UDMA=1/2 and =1/1, showed no-fracture in a flexural test at 1 mm/min and flexural strength and flexural modulus showed no significant difference compared with those of commercially available heat- and self-curing acrylic resins (p>0.01). Within limitation of this investigation, methyl methacrylate-UDMA blend polymer of this composition is available for denture base resin.

Key words:
Denture base resin, Urethane dimethacrylate, Flexural properties

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