

Thesis Title	Preparation of Thermoplastic Mask from Polymer Blends of Polybutylene Succinate and Ethylene Vinyl Acetate for Radiotherapy Application
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Candidate	Mr. Nuttapon Chuenkaek
Thesis Advisor	Asst. Prof. Dr. Jindarat Pimsamarn
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#### Abstract

The objective of this thesis was to study the appropriate ratio of polymer blend of polybutylene succinate (PBS) and ethylene vinyl acetate (EVA) for radiotherapy application. A commercial thermoplastic mask was analyzed by Fourier transform infrared spectroscopy (FTIR). The results indicated that the polymers being used are polyester and polyethylene. The tensile strength, Young's modulus, and percentage elongation at break of the commercial thermoplastic mask were 17.35 MPa, 170.87 MPa, and 387.51, respectively. The polymers used for preparing the thermoplastic mask in this study were polybutylene succinate and ethylene vinyl acetate. The PBS content was varied from 30 to 90 percent weight. The polymer blends of PBS and EVA with various compositions were prepared by mixing on a laboratory-scale twin screw extruder, and molded by injection molding machine. The tensile strength and modulus of the samples were measured by the Universal testing machine. From the results, the tensile strength and Young's modulus of the blends increased with the PBS content. It was found that the appropriate ratio of PBS and EVA component was 70/30 which can be used for preparing the thermoplastic mask. The tensile strength, Young's modulus, and percentage elongation at break of 70/30 of the blends were 19.28 MPa, 179.26 MPa, and 236.59, respectively. It was also found that 10 phr of triacetin added as a plasticizer into the blends was the optimum content for obtaining the good value at the percentage elongation at break. Moreover, the irradiation of 7000 cGy had no effects on the mechanical and chemical properties of the PBS and EVA blends.

Keywords: Head and neck cancer / Polybutylene succinate (PBS) / Radiotherapy / Thermoplastic mask