

RINGKASAN

Telah diteliti pengaruh aditif benzofenon 1 % dan naftalen 1 % terhadap sifat fotodegradasi PET dan aditif kitin 4 % terhadap sifat biodegradasi PET. Degradasi dilakukan terhadap film PET yang dibuat dengan metode pelelehan. Fotodegradasi film PET dilakukan dengan sinar UV selama 24, 48, dan 72 jam. Sedangkan biodegradasi dilakukan dengan menanamkan pada media bakteri anaerob *Clostridium* selama 21, 28, 35, dan 42 hari. Tingkat degradasi diukur melalui penurunan berat kering, perubahan spektra UV dan spektra FTIR film PET.

Hasil penelitian menunjukkan bahwa penurunan berat kering PET tanpa aditif, beraditif benzofenon, dan beraditif naftalen meningkat sebanding dengan waktu fotodegradasi dan tingkat fotodegradasi PET dengan aditif naftalen lebih besar daripada aditif benzofenon. Terjadinya fotodegradasi PET ditandai dengan penurunan intensitas serapan gugus C-O, C=O, $-(CH_2)_n-$, dan C=C aromatik disertai pergeseran serapan λ maksimum pada daerah UV. Film PET tanpa aditif sedikit rentan terhadap biodegradasi sedangkan beraditif kitin meningkatkan sifat biodegradasi ditandai dengan penurunan berat kering PET selama waktu tertentu dan penurunan intensitas serapan gugus C-O dan C=O ester PET.

Dapat disimpulkan bahwa aditif benzofenon dan naftalen berfungsi sebagai sensitivator PET oleh sinar UV dan aditif kitin meningkatkan sifat biodegradasi PET.

SUMMARY

It has been conducted the effect of 1 % benzophenon and 1 % naphthalene additive on photodegradative nature of PET and 4 % chitin additive on biodegradative nature of PET. Degradation was carried out on PET films made by melting method. Photodegradation of PET films was performed by UV light for 24, 48, and 72 hours whereas biodegradation was performed by incubation on medium of *Clostridium* anaerob bacteria for 21, 28, 35, and 42 days. The kinetics of degradation were analyzed by weight-loss kinetics, by changes in ultraviolet spectra and by changes in FTIR spectra of PET films.

The results showed that weight-loss of PET films without additive, with benzophenon additive, and with naphthalene additive increased equally with photodegradation time and kinetics of photodegradation of PET with naphthalene additive were larger than that of benzophenon additive. The photodegradation of PET could be detected by reduction of intensity functional groups of C-O, C=O, $-(CH_2)_n-$, and aromatic C=C which was followed by shift in maximum wavelength in region of UV. The PET films without additive were fairly prone to biodegradation whereas with chitin additive were able to enrich biodegradative nature that was indicated by decrease in weight-loss of PET films at some times and reduction of intensity of C-O and ester C=O in PET.

It could be concluded that benzophenon and naphthalene additive on PET act as UV sensititator and chitin additive increases the biodegradative nature of PET.