

Bioremediation of polyethylene by a thermophilic bacterium

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Polyethylene is widely used for many single use receptacles, packaging, fishing tools and agricultural films. However, due to recently increased environmental pressure, the eventual fate of plastics such as PE after use has become a more and more important matter of concern. It has been conceded that the molecular weight of polyethylene should be lower than 500; or it should at least be formulated with pro-oxidants and then oxidized to low molecular weight so as to promote biodegradability.

A rod shaped, Gram-negative bacterium was isolated from the compost sample, and was subsequently identified as *Chelatococcus* sp. E1 based on analyses of the 16S rRNA gene sequence. The isolated strain exhibited 16S rRNA sequence similarity of 98.95% to a reference strain, *Chelatococcus daeguensis* KCTC 12979.

The bacterium was active for the degradation of PE up to weight average molecular weight of 23,700 even in the absence of pre-oxidation.

The FTIR analyses of the PE before and after biodegradation revealed that the C-O stretching peaks and those corresponding to alkenes became more intense, as a result of the biodegradation; indicating that dehydrogenation took place concomitantly with microbial oxidation.

Biography

Mal Nam Kim completed his Ph.D from Compiegne University, France. She has been a professor at Sangmyung University, Korea, since 1982. Hyun Jeong Jeon is a Ph.D student at Sangmyung University.

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