Characterization and antibacterial properties of nanosilver-applied polyethylene and polypropylene composite films for food packaging applications

Yumi Jo, Coralia V. Garcia, Seonghyuk Ko, Wooseok Lee, Gye Hwa Shin, Jae Chun Choi, Se-Jong Park, Jun Tae Kim

www.elsevier.com/locate/sdj

PII: S2212-4292(17)30420-0
DOI: https://doi.org/10.1016/j.fbio.2018.03.008
Reference: FBIO289

To appear in: *Food Bioscience*

Received date: 18 July 2017
Revised date: 19 March 2018
Accepted date: 24 March 2018

Cite this article as: Yumi Jo, Coralia V. Garcia, Seonghyuk Ko, Wooseok Lee, Gye Hwa Shin, Jae Chun Choi, Se-Jong Park and Jun Tae Kim, Characterization and antibacterial properties of nanosilver-applied polyethylene and polypropylene composite films for food packaging applications, *Food Bioscience,* https://doi.org/10.1016/j.fbio.2018.03.008

Characterization and antibacterial properties of nanosilver-applied polyethylene and polypropylene composite films for food packaging applications

Yumi Jo[a], Coralia V. Garcia[a], Seonghyuk Ko[b], Wooseok Lee[b], Gye Hwa Shin[c], Jae Chun Choi[d], Se-Jong Park[d], Jun Tae Kim[a,*]

[a]Department of Food Science and Technology, Keimyung University, Daegu 42601, Korea

[b]Department of Packaging, Yonsei University, Wonju 26493, Korea

[c]Department of Food and Nutrition, Kunsan National University, Gunsan 54150, Korea

[d]Food Additives and Packaging Division, National Institute of Food & Drug Safety Evaluation, Ministry of Food and Drug Safety, Osong, Chungcheongbuk-do 28159, Korea

***Corresponding author:** Dr. Jun Tae Kim; Department of Food Science and Technology, Keimyung University, Daegu 42601, Korea, Tel.: +82 53 580 5171; fax: +82 53 580 5372. jtkim92@kmu.ac.kr

ABSTRACT

Nanocomposite films were developed using master batches of two polymers, namely low-density polyethylene (LDPE) and polypropylene (PP) containing silver (Ag) nanoparticles, by melt compounding and melt extruding. The films became increasingly yellow as the Ag content increased. Morphological evaluation showed the effective incorporation of Ag in the polymers. The Ag/LDPE nanocomposite film showed a comparable strength to that of commercial LDPE, although stiffness increased at high Ag (240 mg/kg) concentration. The Ag/PP nanocomposite