

Modeling of Nanocomposite Films Made of Cloisite 30b- Metal Nanoparticle in Packaging of Soy Burger

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Abstract : This study undertakes to investigate the ability of different kinds of nanocomposite films made of cloisite-30B with different percentages of silver and copper oxide nanoparticles incorporated into a low-density polyethylene (LDPE) polymeric matrix by a melt mixing method in order to inhibit the growth of microorganism in soy burger. The number of surviving cell of the total count was decreased by 3.61 log and mold and yeast diminished by 2.01 log after 8 weeks storage at $18 \pm 0.5^\circ\text{C}$ below zero, whilst pure LDPE did not has any antimicrobial effect. A composition of 1.3 % cloisite 30B-Ag and 2.7 % cloisite 30B-CuO for total count and 0 % cloisite 30B-Ag and 4 % cloisite 30B-CuO for yeast & mold gave optimum points in combined design test in Design Expert 7.1.5. Suitable microbial models were suggested for retarding above microorganisms growth in soy burger. To validation of optimum point, the difference between the optimum point of nanocomposite film and its repeat was not significant ($p < 0.05$) by one-way ANOVA analysis using SPSS 17.0 software, while the difference was significant for pure film. Migration of metallic nanoparticles into a food stimulant was within the accepted safe level.

Keywords : modeling, nanocomposite film, packaging, soy burger

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