Eco-Friendly Paper Food Packaging Using PVA Cross-Linking

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After Corona 19, plastic food packaging materials are emerging as the main culprit leading to the deepening of environmental pollution and climate change. It accounts for about 70% of the total plastic emissions, and many paper food packaging materials have been made aware of this, but there are disadvantages such as inferior performance or not being completely eco-friendly compared to plastic food packaging materials. We aim to make paper food packaging that can replace plastic food packaging and does not cause environmental pollution. However, paper has high oxygen and water vapor permeability, is weak against water, and does not have a tensile strength sufficient to store food. To compensate for this, coating was performed using cross-linked PVA, an eco-friendly material. As a PVA cross-linking agent, a coating solution was developed using only fumaric acid and maleic acid at the beginning of the study, but the heating process included in the cross-linking process had many difficulties in the process, so chitosan was used to reduce the heat required for the heating process. A coating solution was also prepared. FT-IR experiments, oxygen and water vapor permeability measurement experiments, and dissociation experiments were conducted while comparing various coating solutions with a crosslinking agent as a variable. As a result of evaluating their suitability as a food packaging material through various experiments, it was found that all of them could fully perform their role as food packaging materials, and it was proved that they had high recyclability and biodegradability. The food packaging material in this study has higher efficiency, economy, and eco-friendliness than existing paper food packaging materials.