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PREPARATION AND CHARACTERIZATION OF FIBROIN BASED pH SENSITIVE FILMS

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Bombyx mori silkworm cocoons consist of two main components: sericin and fibroin. Silk fibroin (SF) is protein that has very wide range of applications, because of its remarkable mechanical properties, biocompatibility and can be chemically modified. Aqueous solutions of SF can be formed by dissociation of intermolecular bonds, and without breaking the polypeptide chains. Aqueous solutions can be further processed into different material formats, like films, gels or powders.

In this work, films made of SF aqueous solution were prepared and characterized. SF was obtained from silkworm cocoons from which sericin was previously removed. SF was treated with 9.3M LiBr solvent. The resulting solution was dialyzed against water and films were made by casting the solution in silicone molds and drying them at 40 °C. In order to make films less brittle, plasticizer polyethylene glycol 200 (PEG 200) was added into aqueous solution of SF. SF films with added red cabbage dye were also made. Red cabbage dye is natural pigment used mainly as a food color. Anthocyanins are compounds that contribute to the color of this dye. The pH of red cabbage solution can affect both its color and intensity. In this work, the red cabbage dye was evaluated as a potential pH indicator that can be used for food packaging. The obtained films were characterized for FTIR analysis, water barrier and optical properties, solubility, and tested to color change on different concentrations of base, which imitates food spoilage.

Keywords: *silk fibroin, films, red cabbage dye*

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