## Studies on Preparation of Nanocollagen and Properties of Its Products

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#### **ABSTRACT**

The purpose of this research was to apply the nanotechnology to nanocize collage which was extracted from pig skin, and study its physicochemical properties changes. The collage extracted from the pig skin was dissolved first using enzymes or acid-alkali treatment, which will then be synthesized in a mixture of emulsion and surfactant to reduce a substances particle diameter or possible effect of particle aggregation in the process of forming nano-sized collagen hydrolysates. The collage solution was also sprayed by electrical pressure enhancing conducted sheet vibrating to make micro-nano size drop and take its particle size. The amino acid composition of the collage products was analyzed using automatic amino acid analyzer, the microstructure was measured by scanning electron microscope(SEM) and transmission electron microscope(TEM). And the collage emulsion was prepared with collage hydrolysate added surfactant, and TiO2 and ZnO and its emulsifying capacity and emulsion stability, viscosity, conductivity and anti-UV rays were also determined. The results were as follows: 1. The yield of collagen was higher when pig skin was homogenized two times, the same result was obtained as the extracted collagen was dried by freezing dehydration. 2. The major amino acid-glycine, proline and hydroxyproline of collage were disappeared from the product prepared from the collagen treated with papain and pepsin. And the major amino acids in the collagen hydrolysates were different with different enzymes and hydrolyzing time. 3. It can be obtained the micro-nano sized particles from the extracted collagen was nozzler-sprayed with electric-pressure enhancing conducting sheet vibrating into the hydrophobic receptor. 4. Emulsifying capacity and emulsion stability of collagen emulsion decreased with pH value increased, however, the highest values were reached at pH 3; Viscosity of collagen was decreased as it was hydrolyzed, but it was more stable at pH 7 and 9. Conductivity of the collagen emulsion increased with concentration of the surfactant. 5. No filamentous but rough surface structure was found on the SEM micrograph of nanocollagen powder obtained from the pig skin hydrolyzed by pepsin. It could be found the nano-sized structure in TEM micrograph. 6. Anti-UV rays absorption effect for the products from papain and pepsin hydrolyzation and addition of nano-TiO2 or ZnO were higher than the native collagen, especially it can be obtained the synergistic effect when nano-TiO2 and ZnO were combined together.

Keywords: 膠原蛋白、奈米膠原蛋白、木瓜酵素、豬皮、胃蛋白?

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