

# NEW NISIN-ULVAN PARTICLES: LOADING EFFICIENCY

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Nisin is the most popular antimicrobial peptide which has been used in the food sector for improving food safety [1]. It exhibits a wide spectrum antimicrobial activity against Gram-positive bacteria and is produced by *Lactococcus lactis* subsp. *lactis*. Nisin is a cationic peptide composed of 34 amino acid residues.

To protect nisin from the interaction with food components and to ensure the stability of antimicrobial peptide during food processing and storage period, nisin, as the core material, is coating with the wall materials. There are a variety of food-grade wall materials including proteins, polysaccharides and lipid. In this work, for particles preparation ulvan was used. Ulvan is a water soluble anionic sulfated polysaccharide which can potentially form complexes with oppositely charged molecules [2]. Significant biological activities of ulvan has been demonstrated in both animal and plant systems in in vitro and in vivo studies [3].

In this work, the complexation process between nisin and ulvan at different pH in the range of 4.0-7.0 was performed. The final concentration of ulvan in the product was 0.4 mg/mL, and the nisin concentration was in the range of 0.1-1 mg/mL. The loading efficiency was determined by capillary zone electrophoresis method using 7100 Capillary Electrophoresis unit (Agilent Technologies). The loading efficiency was found to be 100 percent at all pH values with nisin concentration up to 0.3 mg/mL. The subsequent increase in nisin concentration especially at lowest pH values is followed by incomplete encapsulation. The lowest nisin loading efficiency was found at pH 4.0, and the highest one was found at pH 7.0.

Nisin-loaded ulvan particles obtained by the simple and inexpensive complexation method could find their application in food industry.

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