

ABSTRACT**THE EFFECT OF SURFACTANT COMBINATION OF TWEEN 80 AND SPAN 20 ON PHYSICAL STABILITY, IRRITABILITY, AND EFFECTIVITY OF RESVERATROL IN NANOSTRUCTURED LIPID CARRIER (NLC)****DYAH RAHMASARI**

Resveratrol (RSV) is natural polyphenol of stilbene family, found in grape skin and red wine that naturally contains of antioxidant compound. As antioxidant, resveratrol act as inhibitor of ROS and scavenging free radicals. However, resveratrol is a photosensitive compound and has a hydrophobic molecule with the result that not stable in formulation. Therefore the correct delivery system is needed to protecting from oxidation process.

Multiple type of Nanostructured Lipid Carrier (NLC) were successfully produced by high shear homogenization using cetyl palmitate, Medium-chain Triglyceride (MCT), Tween 80 and Span 20. Then 4 different combination concentration of surfactant (Tween 80 and Span 20) were loaded into NLC to compare the effect of increases surfactant concentration on characteristic, effectivity, irritability and physical stability. pH value, viscosity, particle size (PS), polydispersity index (PI), zeta potensial (ZP), drug entrapment efficiency (EE) and production yield were determined. Differential scanning calorimetry (DSC) analysis, X-Ray Diffraction (XRD) analysis and morphological transmission electron microscopy (TEM) examination were conducted.

RSV-NLC showed a good organoleptic appearance and good characterization result in formula: 5% Tween 80 and 5% Span 20. Effectivity test was determined by depth of penetration after 2, 4, and 6 hours sample application in mice dorsal skin using fluorescent microscopy with Rhodamine B as fluorescent label. The irritability test after 24 hours sample application in mice dorsal skin was measured by scoring histopathology with Hematoxilin-Eosin staining that observed by light microscopy. The last, physical stability of each formulas determined based on minimum of particle size, polydispersity index, and pH variation during 30 days storage in room temperature and during Freeze-Thaw test. The result showed that there were significant differences between each RSV-NLC formula in effectivity (penetration test), but there were no significant differences in irritability score. Resveratrol in NLC showed physical instability in 30 days storage and in Freeze-Thaw test.

Keywords: Antiaging, Cosmetic, Nanostructured Lipid Carrier (NLC), Resveratrol, Span 20, Tween 80