

## **ABSTRACT**

### ***PARTICLE SIZE STABILITY TEST FOR NANOSTRUCTURED LIPID CARRIERS (NLC) COENZYME Q10 USING THE FREEZE-THAW METHOD***

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*Skin aging is a natural process in elderly people caused by increased free radicals in the body, anti-aging products that contain antioxidants are needed. In this research, a NLC will be prepared with the active ingredient Coenzyme Q10. The preparation will undergo a particle size stability test. All formulas produced good particle sizes, which still meet the particle size specifications, namely in the 10-1000 nm size range. The selection of the stability test for Nanostructured Lipid Carriers (NLC) coenzyme Q10 was conducted using an accelerated stability test using the Freeze-Thaw Method. The particle size results from each formula have an average value  $\pm$  standard deviation before the Freeze Thaw method (cycle-0), namely FI (112.52 nm  $\pm$  6.074); FII (140.18 nm  $\pm$  1,180); FIII (158.09 nm  $\pm$  1.668); and has an average value  $\pm$  standard deviation after the Freeze Thaw method (cycle-6), namely FI (117.95 nm  $\pm$  3.655); FII (155.51 nm  $\pm$  5.861); FIII (170.25 nm  $\pm$  1.237). The results obtained in this study are stated as P-value (sig) < 0.05, which means there is a significant difference where in the test results there is an influence on particle size stability, the particle size test results before Freeze Thaw (cycle-0) are smaller than particle size value after Freeze Thaw (cycle-6). In this study, the NLC Coenzyme Q10 preparation for the particle size stability test could be declared unstable based on the results of statistical tests.*

**Keywords:** *anti-aging, freeze-thaw, palmitic acid concentration, nanostructured lipid carrier (NLC) Coenzyme Q10, particle size.*