ABSTRAK

Rububiyah, Dilah .R, 2014, Uji Pengaruh Penambahan Alpha Tocopherol Terhasap Stabilitas Asam Askorbat dalam Sediaan Krim Menggunakan Metode *Temperature Stress Test*. Tugas Akhir. Program Studi Farmasi Fakultas Kedokteran Universitas Brawijaya. Pembimbing : (1) Oktavia Eka Puspita, S.Farm, M.Sc., Apt. (2) Alifia Putri Febriyanti, S.Farm, M. Farm. Klin., Apt

Vitamin C atau asam askorbat adalah antioksidan yang paling penting pada kulit dan terkenal dengan penggunaannya pada sediaan kosmetik. Tetapi, asam askorbat bersifat sangat tidak stabil pada larutan berair karena sangat mudah mengalami oksidasi. Stabilitas asam askorbat ini dapat ditingkatkan dengan penambahan zat antioksidan lain seperti alpha tocopherol (Vitamin E) dengan cara meregenerasi senyawa asam askorbat melalui siklus redoks. Penelitian ini bertujuan untuk mengetahui pengaruh alpha tocopherol dalam stabilitas asam askorbat dan besar konsentrasi optimumnya. Penelitian ini dilakukan dengan metode *temperature stress test*. Digunakan perhitungan waktu paruh ($t_{1/2}$) dan waktu kadaluarsa (t_{90}) berdasarkan persamaan Arrhenius. Pengujian dilakukan menggunakan empat formula krim asam askorbat dengan penambahan α-tocopherol dalam berbagai konsentrasi: formula kontrol (0% w/w), formula 1 (0,7% w/w), formula 2 (1,0% w/w), dan formula 3 (1,3% w/w). Hasil penelitian menunjukkan bahwa formula kontrol memiliki $t_{1/2}$ dan t_{90} selama 16,35 jam dan 2,45 jam, formula 1 memiliki $t_{1/2}$ 352,38 jam dan t_{90} selama 53,39 jam, ± 21,5 kali lebih panjang dibandingkan dengan formula kontrol. Formula 2 memiliki $t_{1/2}$ 26,63 jam dan t_{90} 4,035 jam, ± 1,63 kali lebih panjang dibandingkan dengan formula kontrol. Sedangkan formula 3 hanya memiliki $t_{1/2}$ selama 2,008 jam dan t_{90} 0,304 jam. Kesimpulan dalam penelitian ini yaitu α-tocopherol dapat meningkatkan stabilitas asam askorbat dalam sediaan krim dengan konsentrasi optimum sebesar 0,7% w/w.

Kata Kunci: Alpha tocopherol (vitamin E). Asam Askorbat (vitamin C). Stabilitas asam askorbat. *Temperature stress test*

ABSTRACT

Rububiyah, Dilah .R, 2014, Determination of Ascorbic Acid Stability by Addition of Alpha Tocopherol in Cream Preparation Using Temperature Stress Test Method. Department of Pharmacy Medical Faculty Brawijaya University. Supervisor : (1) Oktavia Eka Puspita, S.Farm, M.Sc., Apt. (2) Alifia Putri Febriyanti, S.Farm, M. Farm. Klin., Apt

Vitamin C or ascorbic acid is the most important antioxidant in the skin and known for its use in cosmetic. However, ascorbic acid is very unstable in aqueous solution because it is very susceptible to oxidation. Stability of ascorbic acid can be enhanced with the addition of other antioxidants, such as alpha tocopherol (Vitamin E) in a way to regenerate the degradation product of ascorbic acid with its redox cycle. This study aims to determine the effect of α-tocopherol in ascorbic acid stability and it optimum concentration. This research was carried by temperature stress test method. The calculation of the half-life ($t_{1/2}$) and shelf life (t_{90}) was based on the Arrhenius equation. Tests were carried out using four ascorbic acid cream formulas with addition of different α-tocopherol concentrations: control formula (0% w/w), formula 1 (0.7% w/w), formula 2 (1.0% w/w), and formula 3 (1.3% w/w). The results showed that the control formula has $t_{1/2}$ for 16.35 hours and t_{90} for 2.45 hours, formula 1 has $t_{1/2}$ for 352.38 hours and t_{90} for 53.39 hours, ± 21.5 times longer than the control formula. Formula 2 has $t_{1/2}$ for 26.63 hours and t_{90} for 4.035 hours, ± 1.63 times longer than the control formula. While the formula 3 only has $t_{1/2}$ and t_{90} for 2.008 hours and 0.304 hours, respectively. The conclusion of this study that α-tocopherol may increases the stability of ascorbic acid in cream preparation with an optimum concentration of 0.7% w/w.

Keywords: Alpha tocopherol (vitamin E). Ascorbic Acid (vitamin C). Ascorbic Acid Stability. *Temperature stress test*