ANALISIS KADAR OBAT *CETIRIZINE HYDROCHLORIDE* SEDIAAN SIRUP TERHADAP SUHU DAN LAMA PENYIMPANAN DENGAN METODE SPEKTROFOTOMETRI UV-VIS

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ABSTRAK

Cetirizine hydrochloride merupakan antihistamin generasi kedua yang banyak digunakan dalam terapi alergi dan tersedia dalam bentuk sediaan sirup. Stabilitas sediaan cair seperti sirup relatif lebih rendah dibandingkan sediaan padat, sehingga perlu dilakukan evaluasi terhadap pengaruh suhu dan lama penyimpanan terhadap kadar obat untuk menentukan *Beyond Use Date* (BUD). Penelitian ini dilakukan untuk mengetahui pengaruh suhu dan lama penyimpanan terhadap kadar cetirizine hydrochloride sirup menggunakan metode spektrofotometri UV-Vis. Sampel sirup cetirizine hydrochloride disimpan pada dua kondisi, yaitu suhu ruang (15–30 °C) dan suhu sejuk (8–15 °C) selama 35 hari. Penentuan kadar dilakukan secara berkala (hari ke-0, 7, 14, 21, 28, dan 35) menggunakan spektrofotometri UV-Vis pada panjang gelombang maksimum 231 nm. Validasi metode mencakup uji linearitas, LOD, LOQ, akurasi, dan presisi. Data kadar dibandingkan dengan standar Farmakope Indonesia (90–110%). Panjang gelombang maksimum cetirizine hydrochloride diperoleh pada 231 nm dengan persamaan regresi $y = 0{,}0482x - 0{,}0299$ ($R^2 = 0{,}9979$). Nilai LOD sebesar 12,33 ppm dan LOQ sebesar 37,34 ppm. Uji akurasi menunjukkan % recovery sebesar 100,8%, 99,3%, dan 99,7%, sedangkan presisi menunjukkan %RSD = 1,26%. Penyimpanan pada suhu ruang mempertahankan kadar obat dalam rentang farmakope hingga hari ke-35 dengan nilai T_{90} = 44 hari. Sebaliknya, penyimpanan pada suhu sejuk menunjukkan penurunan kadar lebih cepat dengan nilai T_{90} = 28 hari. Sampel lebih stabil bila disimpan pada suhu ruang (15–30 °C) dibandingkan suhu sejuk (8–15 °C), dengan Beyond Use Date (BUD) yang lebih panjang, sehingga penyimpanan pada suhu ruang direkomendasikan.

Kata Kunci: *Cetirizine Hydrochloride*, Sirup, Penyimpanan, Spektrofotometri UV-Vis

ANALYSIS OF *CETIRIZINE HYDROCHLORIDE LEVELS IN SYRUP PREPARATIONS BASED ON TEMPERATURE AND STORAGE DURATION USING THE UV-Vis SPECTROPHOTOMETRY METHOD*

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ABSTRACT

Cetirizine hydrochloride is a second-generation antihistamine widely used in allergy therapy and is available in syrup dosage form. The stability of liquid preparations such as syrups is relatively lower than that of solid dosage forms; therefore, it is necessary to evaluate the effect of storage temperature and duration on drug content to determine the Beyond Use Date (BUD). This study aimed to investigate the effect of temperature and storage duration on the content of cetirizine hydrochloride syrup using UV-Vis spectrophotometry. The syrup samples were stored under two conditions, namely room temperature (15–30 °C) and cool temperature (8–15 °C), for 35 days. Content determination was carried out periodically (on days 0, 7, 14, 21, 28, and 35) using UV-Vis spectrophotometry at the maximum wavelength of 231 nm. Method validation included tests of linearity, LOD, LOQ, accuracy, and precision. The results were compared to the standards set by the Indonesian Pharmacopoeia (90–110%). The maximum wavelength of cetirizine hydrochloride was found at 231 nm with a regression equation of y = 0.0482x – 0.0299 (R^2 = 0.9979). The LOD and LOQ values were 12.33 ppm and 37.34 ppm, respectively. Accuracy testing showed recovery values of 100.8%, 99.3%, and 99.7%, while precision testing yielded %RSD = 1.26%. Storage at room temperature maintained the drug content within the pharmacopoeial range until day 35, with a T90 value of 44 days. In contrast, storage at cool temperature resulted in a faster decline in drug content with a T90 value of 28 days. The samples were more stable when stored at room temperature (15–30 °C) compared to cool temperature (8–15 °C), with a longer Beyond Use Date (BUD); thus, storage at room temperature is recommended.

Keywords: *Cetirizine Hydrochloride, Syrup, Storage, UV-Vis Spectrophotometry*

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