

- AMOXICILLIN
- COLORIMETRIC ANALYSIS

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STUDI PERBANDINGAN KINETIKA PERURAIAN AMOKSISILIN DAN N-BENZOILAMOKSISILIN DENGAN PENETAPAN KADAR SECARA KOLORIMETRI

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Lembar Pengesahan

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ABSTRACT

COMPARATIVE STUDY OF DEGRADATION KINETICS OF AMOXICILLIN AND *N*-BENZOYLAMOXICILLIN WITH RATE DETERMINATION BY COLORIMETRIC

This research was done to compare stability of amoxicillin and its new derivate, *N*-benzoylamoxicillin. *N*-benzoylamoxicillin has great potency to be developed furthermore because it's more active against *Pseudomonas aeruginosa* and *Staphylococcus aureus*. The stability was determined by studying degradation kinetics of these compounds at various temperatures (40°C, 50°C, 60°C and 70°C) and times (30, 60, 90, 120, and 150 minutes). The parameters which can be obtained from this research are rate constant of reaction (k), half-life ($t_{1/2}$) and activation energy (E_a).

The degradation of these compounds was determined by colorimetric method. The principle of this method is simple and specific for compound with β -lactam ring. Hydroxylamine will break β -lactam ring of amoxicillin and *N*-benzoylamoxicillin, and with addition of ferric ion will form chromatic complex. The colored-complex's absorbance can be analyzed quantitatively by Spectrophotometer UV-Vis.

Curve plots between $\log C_t/C_0$ and time which is obtained at various temperatures and times were linier, indicating that the degradation of amoxicillin and *N*-benzoylamoxicillin follows first-order kinetics. The value of physical chemistry's parameters of stability obtained from research shows that amoxicillin as the lead compound is more stable than *N*-benzoylamoxicillin. Calculation Q_{10} of these compounds shows that *N*-benzoylamoxicillin is more stable to hold up elevated the temperature than amoxicillin. Based on this research, it's expected that the next research can be developed furthermore to determine *N*-benzoylamoxicillin's potency and to increase the stability.

Keyword: Amoxicillin, *N*-benzoylamoxicillin, degradation kinetics, colorimetric method, Spectrophotometer UV-vis.