ABSTRAK

Senyawa basa Schiff 4-[(4'-dimetilaminobenzilidena)-amino]benzena sulfonamida yang telah disintesis dari sulfanilamida dengan *p*-dimetilamino benzaldehida diketahui dapat menghambat pertumbuhan bakteri. Sulfadiazin merupakan senyawa golongan sulfonamida yang mempunyai aktivitas bakteriostatik efektif. Seperti halnya sulfanilamida, sulfadiazin memiliki gugus amina aromatik yang bersifat nukleofil, sehingga akan mengadisi karbon karbonil pada molekul *p*-dimetilaminobenzaldehida. Penelitian ini bertujuan untuk mensintesis 4-[(4'-dimetilaminobenzilidena)-amino]-*N*-(2-pirimidinil)benzena sulfonamida melalui reaksi adisi-eliminasi nukleofilik antara sulfadiazin dan *p*-dimetilaminobenzaldehida. Senyawa target sintesis tersebut diharapkan mempunyai sifat antibakteri lebih baik dibandingkan senyawa sulfanilamida-imina, karena sulfadiazin memiliki cincin heteroaromatik yang terikat pada gugus amida sulfon, sehingga dapat meningkatkan aktivitas antibakteri.

Sintesis dilakukan dengan merefluks campuran 2,0 mmol sulfadiazin dan 2,5 mmol *p*-dimetilaminobenzaldehida menggunakan katalis buffer asetat 0,2 M pada pH 3,9 dan suhu 90°C selama 20 jam dalam pelarut dimetil sulfoksida. Adapun kemurnian produk sintesis ditentukan berdasarkan pengamatan organoleptis, uji KLT, serta pemeriksaan titik lebur. Sedangkan struktur molekul senyawa produk sintesis ditetapkan berdasarkan hasil analisis spektrum FT-IR dan ^{1}H-NMR.

Hasil penelitian memperlihatkan bahwa senyawa produk sintesis berupa serbuk berwarna kuning, tidak berbau, mempunyai rentang lebur 266,3-268,8°C, larut dalam dimetil sulfoksida, kloroform, dan aseton, praktis tidak larut dalam metanol, asetonitril, etanol, dan etil asetat. Sedangkan uji KLT dengan sistem fase gerak kloroform:metanol = 8:2 memberikan nilai Rf 0,89. Elusidasi struktur FT-IR dan ^{1}H-NMR menunjukkan bahwa senyawa produk sintesis merupakan senyawa 4-[(4'-dimetilaminobenzilidena)-amino]-*N*-(2-pirimidinil)benzenasulfonamida dengan rendemen sebesar 89,25%.

Kata kunci: Adisi-eliminasi nukleofilik, antibakteri, basa Schiff, *p*-dimetil aminobenzaldehida, sulfadiazin

ABSTRACT

Schiff base compound 4-[(4'-dimethylaminobenzylidene)-amino] benzenesulfonamide which has been synthesized from sulfanilamide with *p*-dimethylaminobenzaldehyde was known can inhibit bacterial growth. Sulfadiazine is a compound of sulfonamide that has effectively bacteriostatic activity. As well as sulfanilamide, sulfadiazine has an amine aromatic group which is nucleophile, so it can attack carbonyl carbon of *p*-dimethylaminobenzaldehyde. The objective of this research for synthesizing 4-[(4'-dimethylaminobenzylidene)-amino]-*N*-(2-pyrimidinyl)benzenesulfonamide via a reaction of addition-elimination nucleophilic between sulfadiazine and *p*-dimethylaminobenzaldehyde. The target compound of synthesis is expected to possess a better antibacterial activity than sulfanilamide-imine derivatives, because sulfadiazine has heteroaromatic ring that attached to N sulfonamide group, so it can improve antibacterial characteristic.

The synthesis was done by refluxing a mixture of 2.0 mmol sulfadiazine and 2.5 mmol *p*-dimethylaminobenzaldehyde with 0.2 M acetate buffer at pH 3.9. The mixture was stirred for 20 hours in dimethyl sulfoxide at 90°C. The purity of product synthesis was determined based on an organoleptic observation, thin-layer chromatography (TLC) test, and melting-point examination. While the molecular structure of synthesis product was confirmed by the analysis results of FT-IR and ^{1}H-NMR spectrums.

The results showed that the synthesis product was in the form of yellow powder, odorless, has a melting range of 266.3 to 268.8°C, soluble in dimethyl sulfoxide, chloroform, and acetone, practically not soluble in methanol, acetonitrile, ethanol, and ethyl acetate. While the TLC test in chloroform:methanol = 8:2 as the mobile phase system, provides the score of retention value (Rf) 0.89. Structure elucidations of FT-IR and ^{1}H-NMR showed that the synthesis compound was a 4-[(4'-dimethylaminobenzylidene)-amino]-*N*-(2-pyrimidinyl)benzenesulfonamide with crude product yield was obtained 89.25%.

Keywords: Addition-elimination nucleophilic, antibacterial, base Schiff, *p*-dimethylaminobenzaldehyde, sulfadiazin