

SINTESIS SENYAWA AZINA ASETOFENON-VANILIN SEBAGAI KEMOSENSOR KOLORIMETRI UNTUK DETEKSI ANION SULFIDA

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INTISARI

Sintesis senyawa azina asetofenon-vanilin (**AAV**) serta uji aktivitasnya sebagai kemosensor anion sulfida telah dilakukan. Sintesis **AAV** dilakukan menggunakan metode refluks yang melibatkan reaksi antara azina vanilin (**AV**) dan asetofenon dalam larutan etanol selama 24 jam menggunakan katalis TsOH. Penentuan aktivitas kemosensor senyawa **AAV** dilakukan menggunakan beberapa jenis anion, di antaranya S^{2-} , F^- , Cl^- , Br^- , I^- , CN^- , CH_3COO^- , NO_3^- , dan N_3^- . Kemampuan senyawa **AAV** mendeteksi anion ditinjau berdasarkan perubahan warna dan nilai absorbansi yang terukur dari spektrofotometer UV-Vis. Uji aktivitas kemosensor senyawa **AAV** dilakukan dengan menambahkan variasi larutan anion ke dalam larutan senyawa **AAV** dalam larutan DMSO.

Senyawa **AAV** hasil sintesis berwujud padatan kuning cerah dengan rendemen 74,63% dan titik leleh pada rentang 208 – 210 °C. Hasil pengujian menunjukkan bahwa senyawa **AAV** dapat mendeteksi anion sulfida dan memberikan respon perubahan warna dari tidak berwarna menjadi kuning dengan nilai limit deteksi (LOD) sebesar $4,83 \times 10^{-4}$ M. Mekanisme interaksi senyawa **AAV** dan anion sulfida mengindikasikan terjadinya proses deprotonasi gugus hidroksil aromatik ($Ar-OH$) pada dua molekul senyawa **AAV** yang dilakukan oleh satu anion sulfida. Uji aktivitas kemosensor juga menunjukkan bahwa senyawa **AAV** dapat digunakan untuk mendeteksi anion sulfida secara kuantitatif menggunakan media air dan secara kualitatif menggunakan media kertas saring.

Kata kunci: anion sulfida, azina asimetris, kemosensor, kolorimetri

SYNTHESIS OF ACETOPHENONE-VANILINE AZINE AS COLORIMETRIC CHEMOSENSOR FOR SULFIDE ANION DETECTION

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ABSTRACT

Acetophenone-vanillin azine (**AAV**) has been synthesized and analyzed as colorimetric chemosensors for sulfide anion detection. This study was aimed to synthesize acetophenone-vanillin azine (**AAV**) and to study its activity in detecting sulfide anions. The **AAV** was synthesized using the reflux method which involved a chemical reaction between vanillin azine (**AV**) and acetophenone in an ethanolic solution for 24 hours using TsOH as a catalyst. The activity examination of **AAV** for colorimetric chemosensor was then carried out on several anions such as S^{2-} , F^- , Cl^- , Br^- , I^- , CN^- , CH_3COO^- , NO_3^- and N_3^- . The capability of the **AAV** compound to detect sulfide anions was evaluated using UV-Vis spectrophotometer. The examination of **AAV** as a colorimetric chemosensor was performed by adding various anion solutions to the **AAV** in a DMSO solution.

The yield and the melting point of the yellow-colored **AAV** solid that has been synthesized were 74.63% and 208 – 210 °C, respectively. The result showed that the **AAV** solution was able to detect sulfide anion and produce a color change from colorless to a yellow solution with a detection limit (LOD) value of 4.83×10^{-4} M. The interaction model of **AAV** and sulfide anion indicated a deprotonation mechanism of the aromatic hydroxyl (Ar – OH) group in two molecules of the **AAV** compound with one sulfide anion. The analysis of **AAV** as a colorimetric chemosensor also showed that **AAV** solution could detect sulfide anion quantitatively using water as a medium and qualitatively using filter paper.

Keywords: asymmetrical azine, chemosensor, colorimetric, sulfide anion