SINTESIS DAN UJI AKTIVITAS SENYAWA ASETILDISIANOVANILIN SEBAGAI KEMOSENSOR AMINA

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INTISARI

Telah dilakukan sintesis dan uji aktivitas senyawa asetildisianovanilin (ADV) sebagai kemosensor senyawa amina. Senyawa ADV disintesis dari reaksi kondensasi Knoevenagel asetilvanilin dan malononitril dengan katalis basa dietilamina. Hasil sintesis dilakukan elusidasi menggunakan FT-IR, GC-MS, dan ^{1}H-NMR. Uji aktivitas kemosensor dilakukan terhadap amonia, butilamina, dietilamina, dan trietilamina serta uji aplikasi kemosensor pada kesegaran daging ayam yang disimpan pada suhu ruang. Aktivitas kemosensor ditentukan berdasarkan pengamatan warna visual dan spektroskopi UV-Vis.

Sintesis senyawa ADV menghasilkan padatan kuning dengan persen hasil 53,77%. Hasil uji aktivitas kemosensor ADV menunjukkan efek solvatokromik terhadap pelarut DMF, asetonitril, DCM, dan DMSO. Uji ionokromik menunjukkan perubahan warna kuning menjadi tidak berwarna pada amina butilamina sedang amonia, dietilamina dan trietilamina menghasilkan perubahan hipokromik menjadi warna kuning yang lebih kuat dalam pelarut DMF. Senyawa ADV memiliki LOD sebesar 1,2 x 10^{-2}; 1,3 x 10^{-2}; 7,4 x 10^{-2}; -2,5 x 10^{-2} M untuk masing-masing deteksi amonia, dietilamina, trietilamina dan butilamina. Uji kesegaran daging ayam menggunakan strip kertas saring menunjukkan perubahan menjadi warna kuning kemerahan setelah disimpan pada suhu kamar selama 12 jam.

Kata kunci: amina, kemosensor, malononitril, vanilin, kesegaran daging ayam.

SYNTHESIS AND ACTIVITY TEST OF ACETYLDISIANOVANILLIN COMPOUNDS AS AMINE CHEMOSENSORS

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ABSTRACT

The synthesis and activity test of acetyldicyanovanilin (ADV) compound as a chemosensor of amine compounds have been carried out. The ADV compound was synthesized from the Knoevenagel condensation reaction of acetylvanillin and malononitrile with diethylamine base catalyst. The synthesis results were elucidated using FT-IR, GC-MS, and 1H-NMR. The chemosensor activity test was carried out on ammonia, butylamine, diethylamine, and triethylamine as well as the chemosensor application test on the freshness of chicken meat stored at room temperature. Chemosensor activity was determined based on visual color observations and UV-Vis spectroscopy.

The synthesis of the ADV compound produced a yellow solid with a yield of 53.77%. The results of the ADV chemosensor activity test showed a solvatochromic effect on DMF, acetonitrile, DCM, and DMSO solvents. Ionochromic test showed a color change from yellow to colorless for amine butylamine while ammonia, diethylamine and triethylamine produced a hypochromic change to a stronger yellow color in DMF solvent. ADV compound has LOD of 1.2 x 10^{-2}; 1.3 x 10^{-2}; 7.4 x 10^{-2}; -2.5 x 10^{-2} M for the detection of ammonia, diethylamine, triethylamine and butylamine respectively. Freshness test of chicken meat using filter paper strips showed a change to turned reddish-yellow after storage at room temperature for 12 hours.

Keywords: amine, chemosensor, malononitrile, vanillin, chicken meat freshness