

Sintesis Senyawa Turunan Camphor Quinoline Hidrazida-hidrazone melalui Reaksi Pfitzinger dengan Katalis Nanopartikel La₂O₃ serta Uji Aktivitas Antibakteri dan Antioksidan = Synthesis Derivatives of Camphor Quinoline Hydrazide-hydrazone via Pfitzinger Reaction with La₂O₃ Nanoparticles Catalyst and its Antibacterial and Antioxidant Activities

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Abstrak

Pada penelitian ini, senyawa dengan kerangka quinoline dan camphor akan digabungkan melalui linker hidrazida-hidrazone. Senyawa asam quinoline-4-karboksilat menjadi struktur awal sebelum direaksikan dengan camphor. Senyawa ini disintesis melalui reaksi Pfitzinger dengan bantuan katalis nanopartikel La₂O₃. Penggunaan katalis La₂O₃ pada reaksi menunjukkan yield yang relatif baik. Katalis La₂O₃ disintesis melalui metode sol gel menggunakan polietilena glikol (PEG) sebagai capping agent sehingga diperoleh katalis berukuran 40–50 nm. Senyawa asam quinoline-4-karboksilat kemudian melalui tahapan esterifikasi dengan etanol, reaksi dengan hidrazin hidrat, dan reaksi dengan camphor sehingga terbentuk senyawa turunan camphor hidrazida-hidrazone. Selanjutnya, aktivitas antioksidan dari produk target diuji dengan metode DPPH, sedangkan aktivitas antibakteri diuji dengan metode difusi cakram terhadap bakteri Escherichia coli (bakteri gram negatif) dan Staphylococcus Aureus (bakteri gram positif).

.....In this study, compounds with a quinoline and camphor framework will be combined through a hydrazide-hydrazone linker. Quinoline-4-carboxylic acid compounds become the key structure before being reacted with camphor. This compound was synthesized through the Pfitzinger reaction with a La₂O₃ nanoparticle catalyst. The use of La₂O₃ catalyst in the reaction showed a relatively good yield. La₂O₃ catalyst was synthesized through the sol gel method using polyethylene glycol (PEG) as a capping agent to obtain a catalyst with a size of 40–50 nm. The quinoline-4-carboxylic acid compound then went through the stages of esterification with ethanol, reaction with hydrazine hydrate, and reaction with camphor to form a derivative compound of camphor hydrazide-hydrazone. Furthermore, the antioxidant activity of the target product was tested by the DPPH method, while the antibacterial activity was tested by the agar disc diffusion method against Escherichia coli (gram-negative bacteria) and Staphylococcus Aureus (gram-positive bacteria).