

Sintesis senyawa turunan pirimidin dengan nanokatalis CuFe₂O₄ = Synthesis of pyrimidine derivatives compound with CuFe₂O₄ nanocatalyst

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Abstrak

ABSTRAK

Senyawa turunan pirimidin telah berhasil disintesis dengan mereaksikan benzaldehida, etil asetoasetat, dan urea melalui reaksi kondensasi Biginelli. Produk yang terbentuk dikarakterisasi menggunakan alat FTIR, UV-Vis, dan GC-MS. Pada sintesis senyawa ini digunakan nanokatalis CuFe₂O₄ yang berhasil disintesis dengan metode kopresipitasi dan dikonfirmasi dengan FTIR, XRD, TEM dan PSA. Berdasarkan optimasi (senyawa 1) dengan nama IUPAC 5-(ethoxy carbonyl)-4-(phenyl)-6-methyl-3,4-dihydropyrimidin-2(1H)-one diperoleh kondisi optimum dengan waktu 4 jam reaksi, suhu 70°C, dan 7,5% berat katalis dengan yield sebesar 71,57%, untuk (senyawa 2) 5-(ethoxy carbonyl)-4-(phenyl)-6-methyl-3,4-dihydropyrimidin-2(1H)thione diperoleh kondisi optimum selama waktu 4 jam reaksi, suhu 50°C, dan 7,5% berat katalis dihasilkan yield sebesar 76,84% sedangkan untuk (senyawa 3) pada waktu 4 jam reaksi, suhu 70°C, dan 7,5% berat katalis dengan yield sebesar 73,69% belum berhasil membentuk senyawa 5-(ethoxy carbonyl)-4-(phenyl)-6-methyl-3,4-dihydropyrimidin-2(1H)imine dari reaktan benzaldehida, etil asetoasetat dan guanidin.

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ABSTRACT

Pyrimidine derivatives have been synthesized by reacting benzaldehyde, ethyl acetoacetate, urea through Biginelli condensation reaction using CuFe₂O₄ nanocatalyst. Characterization of the three of product were performed by using FTIR, UV-Vis and GC-MS. In the synthesis of these compounds using CuFe₂O₄ nanocatalyst were successfully synthesized by coprecipitation method and characterized by FTIR, XRD, PSA, TEM. Optimum conditions for producing (compound 1) 5-(ethoxy carbonyl)-4-(phenyl)-6-methyl-3,4-dihydropyrimidin-2(1H)one were 4 hours reaction, temperature 70° C and 7.5% weight catalyst with yield 71.57%, (compound 2) 5-(ethoxy carbonyl)-4-(phenyl)-6-methyl-3,4-dihydropyrimidin-2(1H)thione was at 4 hours reaction, 50° C and 7.5% weight catalyst with yield 76.84% and compound 3 were 4 hours reaction, temperature 70° C and 7.5% weight catalyst with yield 73.69% has not succeeded in forming a 5-(ethoxy carbonyl)-4-(phenyl)-6-methyl-3,4-dihydropyrimidin-2(1H)imine.