

GREEN AND EFFICIENT SYNTHESIS OF DIHYDROPYRIMIDINONE ANALOGUES VIA HPA-CLAY CATALYZED BIGINELLI REACTION

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Abstract. This study introduces an environmentally sustainable approach for the synthesis of 3,4-dihydropyrimidin-2(1*H*)-ones (DHPMs), via the Biginelli reaction. A heterogeneous catalyst, Heteropolyacid-Clay (HPA-Clay), is developed by immobilizing H₅PV₂W₁₀O₄₀ on Montmorillonite KSF clay. The catalyst exhibits enhanced stability and catalytic efficiency, confirmed through X-ray powder diffraction and scanning electron microscopy. Utilizing a one-pot multi-component strategy under solvent-free conditions, various aldehydes, urea or thiourea, and ethylacetoacetate generate DHPMs with excellent yields and reduced reaction times. Catalysed by 2 mol% HPA-Clay, the process aligns with green chemistry principles, emphasizing cost-efficiency, environmental sustainability, and recyclability. The catalyst demonstrates consistent activity over multiple cycles, highlighting its potential for advancing Biginelli reactions.

Keywords: multicomponent reaction, heteropolyacid, greenchemistry approach, recyclable catalyst.

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