SYNTHESIS AND CHARACTERIZATION OF (E)-3-(1-METHYL-1H-PYRROL-2-YL)-1-(PYRIDIN-4-YL)PROP-2-EN-1-ONE

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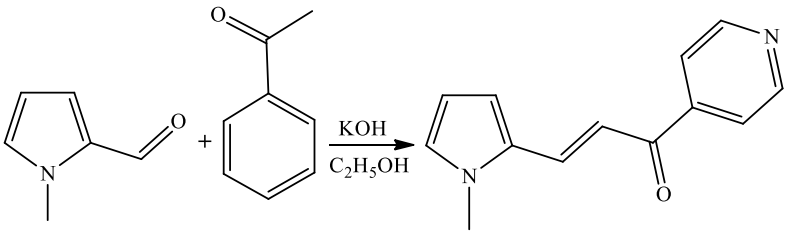
Pyrrole-containing compounds are of significant scientific interest owing to their distinctive electronic properties and their broad range of applications in medicinal chemistry, materials science, and optoelectronics. Particular emphasis has been placed on *N*-substituted pyrroles, which exhibit enhanced chemical stability and high synthetic versatility.

α,β-Unsaturated carbonyl compounds (chalcone-type structures) bearing heteroaromatic fragments are of special interest because of their conjugated π-systems, which enable efficient charge transfer and strong intermolecular interactions. Incorporation of a pyridine moiety into such frameworks further enhances their potential as ligands, bioactive scaffolds, and precursors for coordination complexes, owing to the basicity and metal-binding ability of the pyridine nitrogen atom.

Compounds combining pyrrole and pyridine fragments within a single conjugated system are therefore particularly attractive, as they integrate the electronic richness of the pyrrole ring with the coordination functionality of pyridine. Chalcone-like derivatives containing heteroaromatic units have been reported to exhibit a wide range of biological activities, as well as promising optical and electronic properties, including nonlinear optical behavior and fluorescence. *N*-heterocyclic chalcones, particularly those containing a pyrrole scaffold, exhibit a wide range of biological and pharmacological activities, including antibacterial, antioxidant, antifungal, antileishmanial, anticancer, antitubercular, and antimalarial effects.

During the course of the study, various chalcone derivatives were synthesized based on the Claisen-Schmidt condensation. On the basis of these findings, the synthesis of chalcones bearing a pyrrole ring, as well as the preparation of new derivatives derived from them, was defined as the main objective of this work.

This study reports the synthesis of *(E)*-3-(1-methyl-1H-pyrrol-2-yl)-1-(pyridin-4-yl)prop-2-en-1-one and presents its structural characterization, identifying it as a potentially promising heteroaromatic enone. For the synthesis of this compound



For the synthesis of this compound, pyrrole-2-carbaldehyde was reacted with 4-acetylpyridine under basic conditions. The reaction was conducted in an ethanole medium in the presence of potas-sium hydroxide (KOH). The structure of the resulting product was unambiguously confirmed by ^{1}H and ^{13}C NMR spectroscopic analyses. The progress of the reaction was monitored by thin-layer chromatography (TLC) using Silufol UV-254 plates with a hexane-ethyl acetate (4:1) eluent system. The reaction products were isolated by column chromatography on silica gel (0–70 μm) employing a hexane-ethyl acetate (4:1) solvent system.