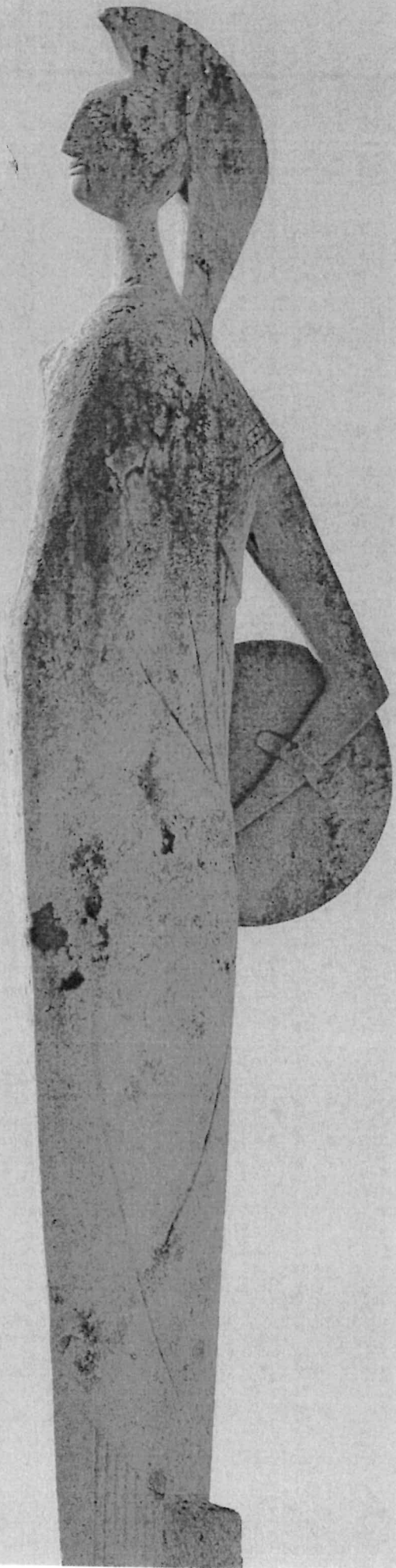




INTERNATIONAL  
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CATALYSIS - XXIII



# BOOK OF ABSTRACTS

# Efficient Synthesis of Six-Membered N-Heterocycles via Pd-Catalysis with Formic Acid Derivatives as CO Surrogates

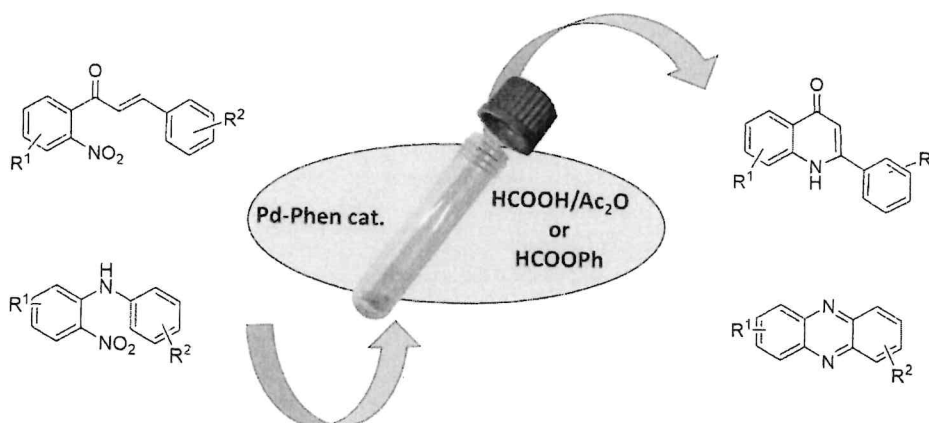
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Transition-metal catalyzed reductive cyclization of nitroarenes represents an efficient strategy to afford N-heterocyclic compounds in one step. In this regard, carbon monoxide emerges as an optimal reductant, allowing clean reactions and a simplified work-up, with gaseous carbon dioxide as the sole stoichiometric byproduct.<sup>1</sup> Recently, the use of CO-surrogates, molecules capable to release CO during the reaction, has allowed to remove the constraints for pressure equipment required to handle gaseous carbon monoxide.<sup>2</sup> Our group has recently reported that phenyl formate acts as an excellent CO-source in the palladium/phenanthroline catalyzed synthesis of indoles,<sup>3</sup> carbazoles<sup>4</sup> and oxazines.<sup>5</sup> A further improvement has been achieved by employing formic acid, in the presence of an equimolar amount of acetic anhydride and a base,<sup>6,7</sup> as a more atom economical and cheaper CO-surrogate. Among the various possible heterocycles obtainable by intramolecular reductive cyclization reactions, those leading to six-membered rings had proven to be more challenging. Here we report the synthesis quinolones<sup>8</sup> and phenazines. Despite harsher conditions are required for the latter transformation it was possible to employ a catalytic ratio of 4000, uncommon for these kinds of reactions.



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