TANDEM INDIUM-MEDIATED REDUCTIVE REACTION/N-ANNULATION REACTION: SYNTHESIS OF BIS-PYRROLEARENE DERIVATIVES FROM ELECTRON DEFICIENT NITROANILINES

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In the past decade, indium have been widely employed as a SET (single electron transfer) reagent and it was applied for the one-pot reaction by us, \textit{i.e.}, an activation of nitro group followed by a coupling reaction with carbonyl group to obtain benzoxazole, benzimidazole, benzopyrrole, and quinoxaline derivatives.\textsuperscript{[1]}

\textit{N}-Heterocyclic compounds containing pyrrole moiety are found in natural products and bioactive molecules that exhibit versatile biological activities.\textsuperscript{[2]} Moreover, polymer such as polypyrroles (ppys) have proven their great potential in the fabrication of microelectronic and optoelectronic devices, including field-effect transistors, because of their good thermal and oxidative stability, flexibility and electrical conductivity.\textsuperscript{[3]}

In this work, the transformation of highly electron deficient anilines towards pyrroles for \textit{N}-annulation reaction was studied, which was not easy with conventional synthetic methods because of their poor reactivity. Indium-mediated reductive/coupling reaction of highly electron deficient 2,6-disubstituted nitroanilines in the presence of 1,4-diketone to 2,6-disubstituted 4-(\textit{1H}-pyrrole-1-yl)aniline followed by \textit{N}-annulation reaction with another 1,4-diketone resulted in bis-pyrrole-containing electron deficient arenes, in reasonable yield.

