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Synthesis of a new class of cationic Pd(II) complexes with 1,2,3-triazol-5-ylidene ligand and their catalytic application in the conversion of internal alkynes to 1,2-diketones

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Abstract

A new class of cationic Pd(II) complexes of the type $[\text{Pd}(\text{Tz})(\text{Cl})(\text{bipy})]^+\text{Cl}^-$ and $[\text{Pd}(\text{Tz})(\text{Cl})(\text{phen})]^+\text{Cl}^-$ (Tz = 1,4-diaryl-3-methyl-1,2,3-triazol-5-ylidene, bipy = 2,2'-bipyridine and phen = 1,10-phenanthroline) with various wing tip groups were synthesized from the corresponding 1,2,3-triazolium iodide via the corresponding chloro bridged dinuclear complexes $[(\text{Tz})(\text{Cl})\text{Pd}(\mu\text{-Cl})_2\text{Pd}(\text{Cl})(\text{Tz})]$. The synthesized cationic complexes were screened for their catalytic activity of hydration of alkynes and found to be excellent towards the selective conversion of internal alkynes to the corresponding 1,2-diketones in good yields. A plausible mechanism was proposed for this conversion.

Keywords

Alkyne, cationic Pd complex, 1,2-diketone, hydration, NHC-Pd complex, 1,2,3-triazol-5-ylidene,

1. Introduction

N-Heterocyclic carbenes (NHCs) have gained exclusive, rapid popularity and emerged as versatile ligands for a wide variety of metal complexes.[1] The success achieved by NHCs is because of their strong σ -electron donating capacity which will allow them to form strong NHC-metal bonds. Due to their stability to air, moisture and strong σ -donor but poor π -acceptor abilities NHCs have been receiving a great amount of attention and becoming a very important

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