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A VERSATILE NEW SYNTHESIS OF MACROCYCLIC AMIDE COMPLEXES

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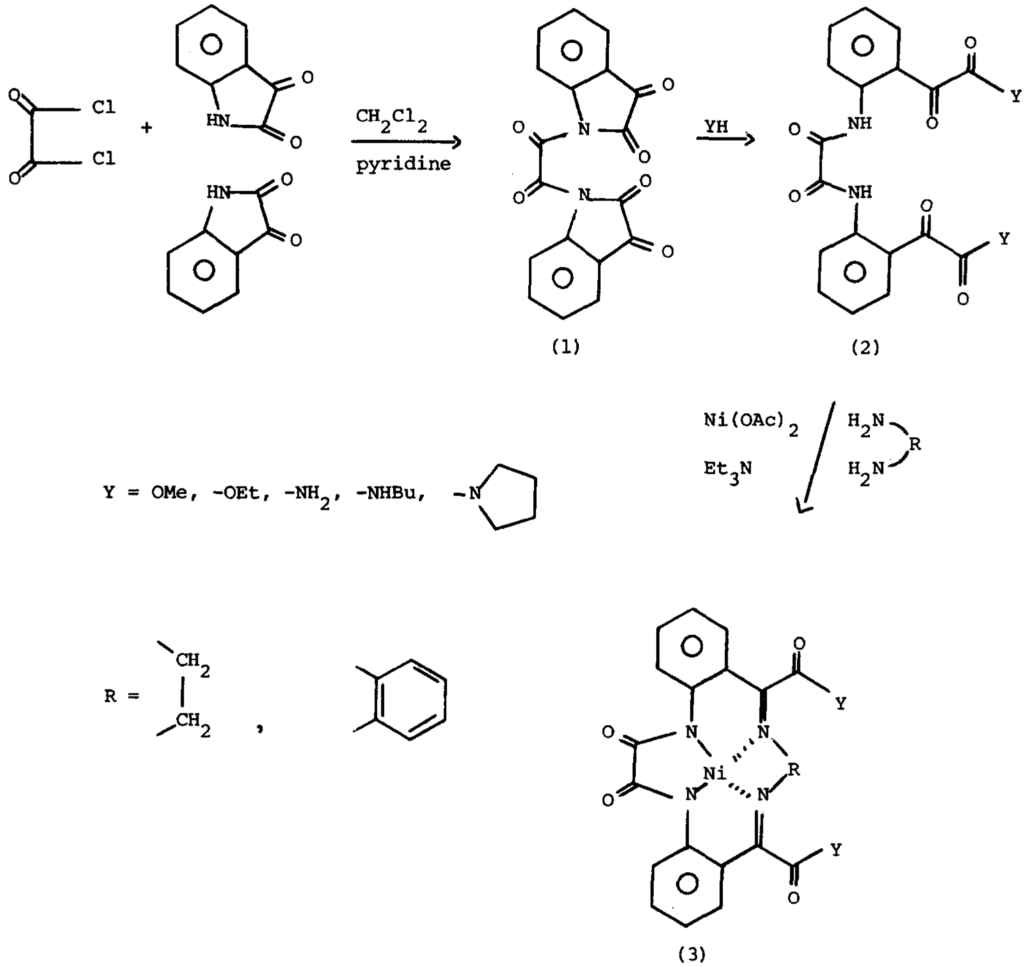
Highly stable macrocyclic amide complexes of nickel(II), copper(II) and cobalt(II) can be formed in metal template reactions involving 2,2'-(oxalyldiimino)bisbenzaldehyde and 1,2-diamines[1]. We now report that the related 2,2'-(oxalyldiimino)bisphenylglyoxylic acid derivatives (2) undergo similar metal template reactions to afford, so far, the nickel(II) complexes (3).

The versatility of the reaction is based on the simple preparation of a wide range of glyoxylic ester and amide derivatives (2) by the nucleophilic addition of alcohols and amines respectively to the oxalylbisisatin (1), which need not be isolated, and which is readily obtained from isatin and oxalyl chloride in methylene chloride containing pyridine. N-Acetylisatin has been shown to undergo ring opening to α-oxo-esters and amides on the addition of alcohols[2,3] and amines[3,4]. However, compounds (1) and (2) have not been described previously, but have now been characterised fully.

Complex formation involving the oxo-esters is effected in the corresponding alcohol as solvent, whereas dimethylformamide is used for the oxo-amides. Reaction is much more rapid than that of the related aldehydes[1], being essentially complete in several hours. Consequently the use of the glyoxylic acid derivatives (2) provides the following advantages compared with the related aldehydes: (i) greater ease of synthesis (ii) greater ease of complex formation and (iii) greater variation with respect to macrocyclic ring substituents (-COY) and isatin substituents, with consequent variation in the properties of the resulting complexes. Further work involving substituent variation and the investigation of complexes of other metals is proceeding.



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