

Reaction between Aldehydes and Isocyanates Catalysed by Metal Carbonyls

By J. DRAPIER, A. J. HUBERT,* and PH. TEYSSIÉ

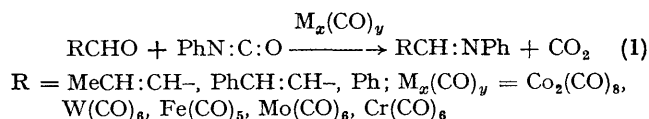
(Laboratoire de Chimie Macromoléculaire et de Catalyse Organique, Institut de Chimie,
Sart Tilman, B. 4000 Liege, Belgium)

Summary Metal carbonyls catalyse the condensation of isocyanates with aldehydes to give imines in high yields.

HETEROCUMULENES form complexes with metal carbonyls;^{2,1} with dodecacarbonyliron, some reduction of the isocyanate ligand to isocyanide occurred,² and phenyl isocyanate reacts with an oxo-complex of rhenium to yield a phenylimido-complex.³ The catalytic cyclotrimerisation of isocyanates,⁴ and the reaction of phenyl isocyanate with phenylacetylene,⁵ show that efficient catalytic processes may occur through activation of the isocyanate group.

We report the excellent catalytical efficiency of metal carbonyls at low concentration in the reaction between isocyanates and aldehydes (equation 1).

This reaction takes place smoothly with sulphonyl isocyanate,⁶ but with other derivatives like phenyl isocyanate it usually requires high temperatures and long reaction times and the yields are moderate.⁷



In the presence of various metal carbonyls, the reaction proceeds readily (100—150°, 0.5—3.5 h) and the yields are 90—100%. $\text{Co}_2(\text{CO})_8$ is the most efficient catalyst.

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