

Co-ordination of hydrazine and substituted hydrazines on reaction with $[\text{Rh}_2(\text{CO})_4\text{Cl}_2]$ and disproportionation of 1,2- $\text{N}_2\text{H}_2\text{Ph}_2$

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Abstract

The progressive addition of hydrazine and the following increasingly substituted hydrazines L (N_2H_4 Ia, H_2NNHMe Ib, H_2NNHPh Ic, H_2NNMe_2 Id, or MeHNNHMe Ie) to $[\text{Rh}_2(\text{CO})_4\text{Cl}_2]$ resulted in the initial formation of $[\{\text{Rh}(\text{CO})_2\text{Cl}\}_2(\mu\text{-L})]$ 1 followed by the formation of $\text{cis-}[\text{Rh}(\text{CO})_2\text{L}(\text{Cl})]$ 2; analogous mononuclear complexes were formed directly on addition of the more heavily substituted hydrazines Me_2NNMe_2 If and H_2NNPh_2 Ig, but addition of 1,2- $\text{N}_2\text{H}_2\text{Ph}_2$ IIh to $[\text{Rh}_2(\text{CO})_4\text{Cl}_2]$ resulted in disproportionation of the hydrazine and formation of $\text{cis-}[\text{Rh}(\text{CO})_2(\text{NH}_2\text{Ph})\text{Cl}]$ 3 and $\text{cis-}[\text{Rh}(\text{CO})_2(\text{PhN}=\text{NPh})\text{Cl}]$ 4. The above complexes have been spectroscopically characterised by IR and $^{13}\text{C}/^{15}\text{N}$ NMR measurements. X-Ray structural analysis on $[\{\text{Rh}(\text{CO})_2\text{Cl}\}_2(\mu\text{-L})]$ (L = H_2NNHMe or MeHNNHMe) confirmed that L adopts a $\mu\text{-}\eta^1:\eta^1$ -mode of bonding with a cisoid arrangement of the $\text{Rh}(\text{CO})_2\text{Cl}$ groups about the N-N bond.