Di-tungsten Bis-carbene Complexes Linked by Condensed Heteroaromatic Spacers

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Dedicated to Prof. Helgard G. Raubenheimer on the occasion of his 65th birthday

The 2,7-dilithiated substrates of 3,6-dimethylthieno[3,2-b]thiophene, N,N′-dimethylpyrrolo[3,2-b]pyrrole and N-methylthieno[3,2-b]pyrrole were reacted with W(CO)\textsubscript{6} to give, after subsequent alkylation with Et\textsubscript{3}OBF\textsubscript{4}, the ditungsten biscarbene complexes [(CO)\textsubscript{5}W\{C(OEt)XXC(OEt)\}W(CO)\textsubscript{5}] (XX = condensed heteroaromatic spacers). Sites of attack during the dilithiation of the condensed rings were studied and compared, and the yields of the desired ditungsten biscardene complexes optimized by changing the reaction conditions according to the role of the heteroatoms in the rings. The crystallographic data of the three ditungsten biscardene complexes are reported and their structural features compared. The methyl substituents on the condensed heteroaromatic rings play an important role in determining the molecular configurations.

Key words: Dinuclear Carbene Complexes, Condensed Heterocycles, Thiophene, Pyrrole, Tungsten