

27 et 28 Mai 2010

## Metal-carbonyl clusters assembled through multidentate phosphane ligands

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**Keywords :** metal-carbonyl cluster, phosphanes

Synthesis of structurally well defined materials constituted by high nuclearity metal clusters or high molecular weight molecules containing clusters have attracted considerable efforts both in pure and applied research.

Transition metal clusters can be used as building blocks for the synthesis of molecular networks, macromolecules and nanomaterials with applications in nanoelectronics, nanolithography, NLO. This is due to their peculiar structures and to the possibility to behave as electronic nanocapacitors.

We have investigated the reactivity between  $[\text{Ir}_4(\text{CO})_{12}]$  or  $[\text{Ir}_4\text{Br}(\text{CO})_{11}]^-$  and multidentate phosphane ligands, assembling up to eight metal clusters. Fig. 1a and 2a show some ligands used. In particular the new 180tertetraphos has been synthesised in our laboratories.

Two examples where four  $\text{Ir}_4$  clusters are assembled through phosphanes are reported in Fig. 1b<sup>1</sup> and 2b.

We are currently investigating other clusters like  $[\text{Ir}_6(\text{CO})_{16}]$ ,  $[\text{Ir}_6(\text{CO})_{15}]^{2-}$  and  $[\text{Pt}_{19}(\text{CO})_{22}]^{4-}$ .

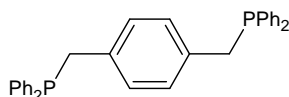


Fig. 1a: dppmb

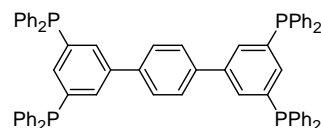


Fig. 2a: 180tertetraphos

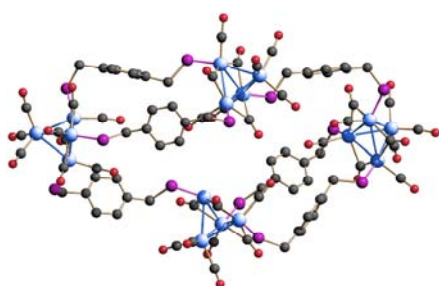


Fig. 1b:  $[\{\text{Ir}_4(\text{CO})_9\}_4(\text{dppmb})_6]$   
Phenyls are omitted for clarity.

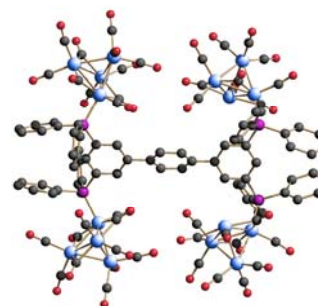


Fig. 2b:  $[\{\text{Ir}_4(\text{CO})_{11}\}_4(180\text{tertetraphos})]$

**Reference :** 1. G. Peli, M. Daghetta, P. Macchi, A. Sironi, L. Garlaschelli, *Dalt. Trans.*, **2010**, 39, 1188

**Acknowledgements :** This research is funded by the Italian "Ministero dell'Istruzione, Università e Ricerca."

I would like to mention people that collaborate in this work: Prof. Alessandro Ceriotti, Dr. Piero Macchi, Dr. Giulia Peli, Prof. Angelo Sironi, and Dr. Giuseppe Lapadula. Finally, a heartfelt thanks to Dr. Simona El Afefey.