



*French - Italian*  
**COORDINATION  
CHEMISTRY** *days*

24/25/26 JANUARY 2024 | STRASBOURG

ISIS - Institut de Science et d'Ingénierie Supramoléculaires

[jcc2024.sciencesconf.org](http://jcc2024.sciencesconf.org)

**BOOK OF ABSTRACTS**



## Schiff bases of the BIAN family and their metal complexes: recent advances from our group

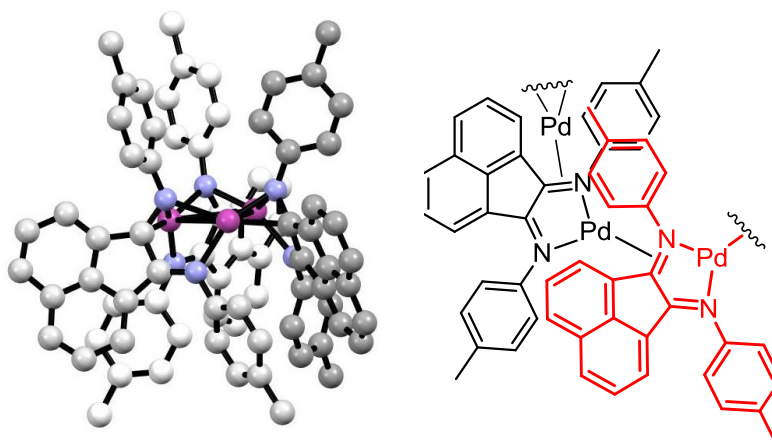
F. Ragaini,<sup>\*a</sup> F. Ferretti,<sup>a</sup> and P. Macchi,<sup>b</sup>

<sup>a</sup> Università degli Studi di Milano, Dipartimento di Chimica, v. C. Golgi 19, 20133 Milano (Italy)

<sup>b</sup> Politecnico di Milano, Dipartimento di Chimica, Materiali e Ingegneria Chimica "Giulio Natta", via Mancinelli 7, Milano (Italy)  
fabio.ragaini@unimi.it

**Keywords:** Schiff bases; Nitrogen Ligands, Palladium complexes

Ar-BIAN (bis(arylimino)acenaphthene) Schiff bases have found wide application as ligands for both transition and main group metals because their rigid structure imparts the correct geometry for chelation and improves the stability of the compounds against hydrolysis and rupture of the central C-C bond. After a brief historical introduction, the talk will focus on recent and unpublished achievements in our group. In particular, some results will be described related to the use of a reduced form of the BIAN compounds, Ar-BIANH<sub>2</sub>.<sup>[1,2]</sup> Such compounds can be obtained by reduction of the corresponding Ar-BIAN compounds by several techniques (NaBH<sub>4</sub>, H<sub>2</sub>NNH<sub>2</sub>/Pd, Na/MeOH, electrochemistry...) and, albeit air sensitive, can be conveniently stored in a dinitrogen atmosphere for years. As one notable example, treatment of palladium acetate with these ligands results in the reduction of palladium(II) to palladium(0) and coordination of the so formed Ar-BIAN to the latter. Other ligands, e.g. olefins, can also be bound, but in their absence an unprecedented trinuclear complex was obtained, which is formally the first palladium(0) compound only stabilized by nitrogen ligands. Its X-ray structure shows that each palladium atom is coordinated in a standard  $\kappa^2$ N chelating way to an Ar-BIAN ligand and in a  $\eta^2$  way to a C=N double bond of another Ar-BIAN ligand. The latter is itself chelating a second palladium atom and the same bonding scheme extend to a third Pd(Ar-BIAN) unit, which closes the loop over the first palladium atom (Figure 1).



**Figure 1** X-Ray structure of trimeric [Pd(4-MeC<sub>6</sub>H<sub>4</sub>-BIAN)]<sub>3</sub> and its partial bonding scheme.

Overall, the complex has a propeller shape, with the six aryl rings divided in two inequivalent groups. Other complexes have also been obtained showing unusual structures and their synthesis will be described.

1. M. Viganò, F. Ferretti, A. Caselli, F. Ragaini, M. Rossi, P. Mussini, P. Macchi, *Chem. Eur. J.* **2014**, *20*, 14451-14464.
2. A. Cimino, F. Moscatelli, F. Ferretti, F. Ragaini, S. Germain, J. Hannedouche, E. Schulz, L. Luconi, A. Rossin, G. Giambastiani, *New J. Chem.* **2016**, *40*, 10285-10293.