



UNIVERSITA' DI MESSINA
FACOLTA' DI SCIENZE

Dipartimento di Chimica Inorganica, Analitica
e Struttura Molecolare



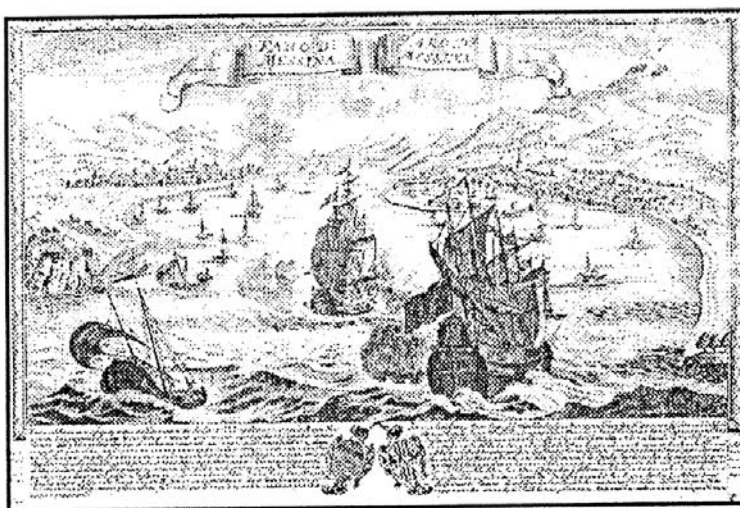
Società Chimica Italiana
visione di Chimica Inorganica



Atti Accademia Peloritana dei Pericolanti
Classe I di Scienze Fisiche
Matematiche e Naturali

WORKSHOP ON PLATINUM CHEMISTRY

ABSTRACTS



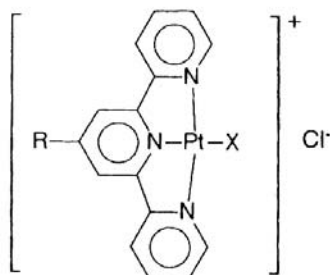
MESSINA 30-31 MAGGIO 1994
Aula dell'Accademia

**SYNTHESIS, CHARACTERIZATION
ABSORPTION SPECTRA
AND LUMINESCENCE PROPERTIES
OF PLATINUM(II)
TERPYRIDINE CATIONIC COMPLEXES**

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A series of cationic complexes of platinum(II) containing terpyridine ligands of the type $[\text{Pt}(\text{R-terpy})\text{X}]\text{Cl}$ ($\text{R}=\text{H}$, Ph; $\text{X}=\text{Cl}$, Me, Ph) were synthesized and fully characterized by ^1H , ^{13}C and ^{195}Pt NMR spectroscopy. The terpyridine behaves as a tridentate ligand and no evidence of fluxionality has been found. ^1H NMR data are strongly indicative of a dimerization process in aqueous or alcoholic solution, as observed previously for other square planar compounds containing the same ligand ¹ and in organometallic species with $\text{R}=\text{H}$ and $\text{X}=\text{Me}$ ². When X is a phenyl group the formation of the dimer is hindered.

The absorption spectra are dominated by intense bands in the UV region (ϵ in the range 10^4 - 10^5 $\text{M}^{-1}\text{cm}^{-1}$) attributed to terpy-centered (LC) transitions, and by moderately intense bands in the visible (ϵ in the range 10^3 - 10^4 $\text{M}^{-1}\text{cm}^{-1}$) assigned to metal-to-ligand charge transfer (MLCT) transitions.



All the compounds are strongly luminescent at 77K in MeOH/EtOH 4:1 (v/v) rigid matrices from LC and / or MLCT excited states (emission maxima in the range 500-600 nm, lifetimes on the microsecond time scale). Except for X=phenyl, the complexes exhibit a second luminescence band at lower energies, that can be attributed to a Pt-Pt σ^* to polypyridine ligand CT level. Most of the compounds are moderately luminescent in deoxygenated solutions even at room temperature. The emission bands are in all cases red-shifted with respect to the low temperature emission bands, confirming the charge transfer nature of the processes. The presence of the lower energy band supports the formation of dimeric species.

The structural and photophysical properties of these complexes are being investigated for their use as probes for nucleic acids.

REFERENCES

- [1] Jennette K.W., Gill J.T., Sadownick J.A., Lippard S.J., *J. Am. Chem. Soc.* **1976**, 98, 6159-6168. Lippard S.J., *Acc. Chem. Res.* **1978**, 11, 211-217.
 [2] manuscript in preparation.

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