



UNIVERSITA' DI MESSINA
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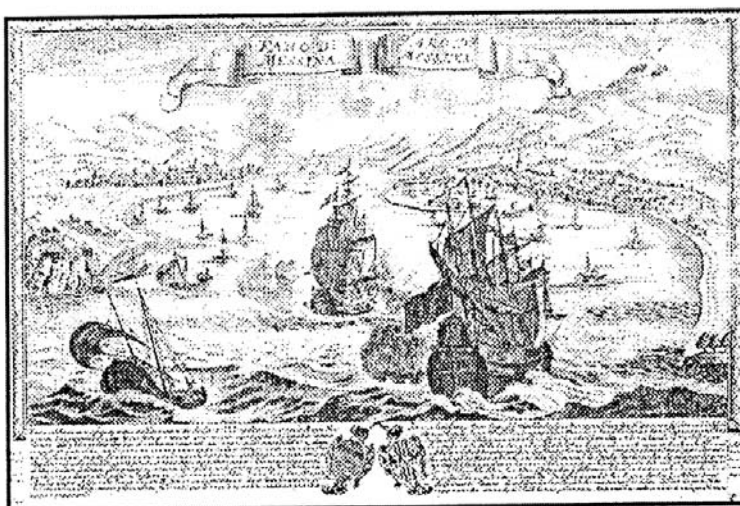
Società Chimica Italiana
visione di Chimica Inorganica



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

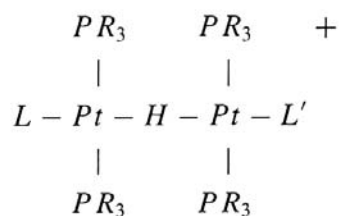
**X-RAY AND NEUTRON SCATTERING STUDIES
OF $Pt - H$ INTERACTIONS**

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The study of the nature of the $M - H$ and $M - H - M'$ interactions has been an active area of research for a long time.

One of the most interesting aspect of this study has been the relationship between molecular architecture and bonding. While many polyhydrido complexes have been described, some features observed in mono-hydrido bridged systems show that these are worthy of a detailed study as they may provide a better insight into the nature of the $M - H - M$ bond.

A class of compounds suitable for this type of study is shown below:



In this series of complexes (1) systematic variations of L and L' might allow to establish the influence of electronic factors on their structures. Thus X -ray structural studies have been carried out on some members of this series, but, given the well known limitations of the X -ray data, more informations were needed for a complete characterization (e.g. accurate values for the $M - H - M$ angle). As it proved impossible to obtain crystals suitable for neutron diffraction, an Incoherent Inelastic Neutron Scattering (*IINS*) study was carried out to obtain a detailed picture of $M - H$ vibrations (2). The *IINS* data together with those from diffraction lead to a satisfactory description of these hydrides.

A second type of $M - H$ interaction appears when a transition metal is proximate to a carbon-hydrogen bond leading to the formation of a $M \cdots H - C$ "moiety". The strength of this interaction may vary from the strong "agostic" case (a $2e-3c$ bond) (3) to the weak "remote" as found in complexes like *trans-LPtCl₂* (quinoline-8-carbaldehyde) (4).

We have developed criteria, both in the solid state (structural parameters) and in solution ($J(Pt, H)$) to recognize these interactions and define the geometric and electronic factors necessary for their existence. Thus it is possible to "tune" these interactions by an appropriate choice of the ligand X (5).

Some of the recent results obtained by this approach will be discussed.

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