



# **XIX EuCOMC**

## **19<sup>th</sup> EuCheMS International Conference on Organometallic Chemistry**



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**Book of abstracts**



Université  
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# XIX EuCheMS Conference on Organometallic Chemistry

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**METAL ACETYLIDES FOR NONLINEAR OPTICS: FIRST  
HYPERPOLARIZABILITIES OF Fe (II), Ru (II) AND Ni (II) BEARING  
NITRO SUBSTITUTED THIENYL CHROMOPHORES**

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Nonlinear Optics deals with the modification of material properties under the influence of intense light beams, resulting in processes that manipulate the amplitude, phase, polarization and frequency of emergent optical beams.<sup>[1]</sup> NLO materials find important applications in various photonic technologies as electro-optic switching devices for telecommunication, optical information processing and laser technology. The search and design of highly effective molecules for NLO applications, namely second harmonic generation (SHG) is therefore an important issue.

Our studies concerning organotransition metal complexes of group VIII metals combined with heterocyclic  $\pi$ -conjugated chromophores in an asymmetric *push-pull* fashion, have shown first hyperpolarizability ( $\beta$ ) values that suggest promising SHG effects.<sup>[2,3]</sup>

Herein, we describe the synthesis, spectroscopic and electrochemical characterization of six new  $\eta^5$ -monocyclopentadienyliron (II), ruthenium (II) and nickel (II)  $\sigma$ -acetylide complexes bearing nitro substituted thienyl chromophores. The  $\beta$  parameter was measured at 1500 nm, in chloroform solutions, by means of Hyper-Rayleigh Scattering technique.<sup>[4]</sup> Our results show that  $\beta$  parameter is strongly dependent on the metal center and the conjugated  $\pi$ -system of the organic chromophore. In order to assess possible structure-activity correlations, the spectroscopic data together with the electrochemical results obtained by cyclic voltammetry are examined at the light of the obtained first hyperpolarizabilities values.



**References:**

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