

Incorporation of One and Two Metal Centers (Pt and Ru) in π -conjugated Push-pull Chromophore for Enhanced Nonlinear Optics (NLO) Applications

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Organometallic molecular systems exhibiting interesting properties, such as non-linear optical (NLO) responses, luminescence and energy photoconversion, are of great interest in the preparation of novel materials with potential applications in opto-electronics,¹ photonics² and Dye-Sensitized Solar Cells (DSSC).³ This presentation will highlight the synthesis and properties of new asymmetrical D- π -M- π -A push-pull mono-ruthenium, mono-platinum dialkynyl complexes and di-platinum polyynediyl complexes incorporating pyranilidene ligands as donor groups (D) and pentafluorobenzene, formaldehyde, malononitrile, indane-1,3-dione, pyrimidine or pyrimidinium iodide as electron attracting groups (A).⁴

All complexes investigated for their NLO properties using the Electric-Field-Induced Second Harmonic (EFISH) generation technique exhibited positive $\mu\beta_{\text{EFISH}}$ values in chloroform. With the same combination of donor-acceptor groups, the length of the polyene linkers and the number of platinum centers do not seem to significantly affect the NLO responses of these complexes (Figure). However, their structural configuration and the nature of the metal center play a significant role, as shown by the promising highest $\mu\beta_{\text{EFISH}}$ values for the V-shaped platinum complex and for the mono-ruthenium complex of the series (Figure).

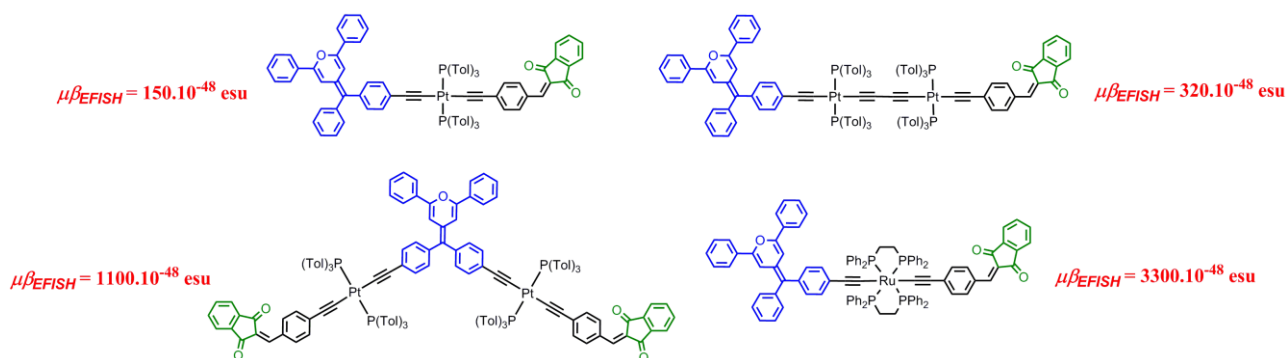


Figure Examples of investigated complexes with their NLO responses (measured in CHCl_3)

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