New cyclometalated Au(III) dialkynyl complexes with tunable phosphorescence and high dioxygen sensibility

Shakirova Julia[1], Grachova Elena[1], Tunik Sergey [1]

[1] *Saint-Petersburg State University, Institute of Chemistry, Saint-Petersburg, Russia*

E-mail: degget2006@gmail.com

Nowadays phosphorescent heavy-metal complexes are considered as promising bioimaging probes due to their unique photophysical characteristics and high sensitivity to the properties of biological environment. Good deal of phosphorescent complexes based on the Ru(II), Re(I), Ir(III), Rh(III), Os(II), Pt(II), Pd(II) and Au(I) metallocenteres have already been used in bioimaging,[1] at the same time phosphorescent Au(III) complexes are relatively unexplored.[2] In this study we present the synthesis and photophysics of new cyclometalated Au(III) dialkynyl complexes (Fig. 1a) containing different cyclometalating ligands, which are able to modulate emission parameters since it was earlier shown that emission of this type complexes originates from metal perturbed ^{3}IL ($\pi-\pi^*$) transitions localized at the cyclometalated fragment.[2] Amino group and *N*-hydroxysuccinimide ester were used as substituents in the alkynyl ligands with the aim for possible covalent binding of the chromophores with biological molecules or functionalized organic dyes.

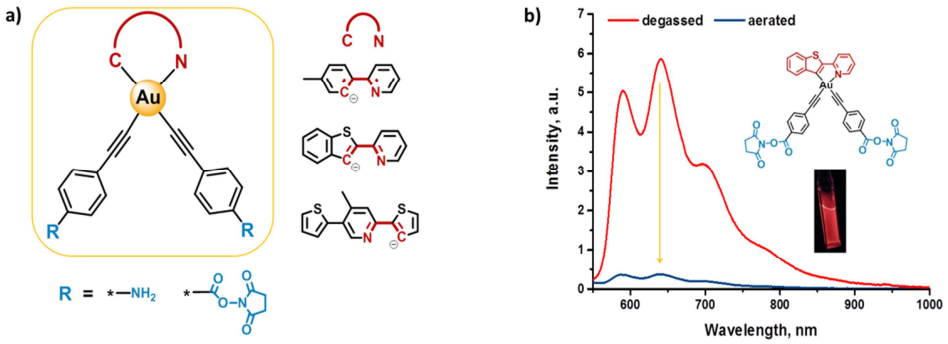

Figure 1. a) Schematic structure of new cyclometalated Au(III) dialkynyl complexes, b) emission spectra of complex in degassed and aerated DCE solution and photography of emission in degassed solution

Photophysical properties of all the complexes obtained were thoroughly investigated. This type of compounds demonstrate moderate phosphorescence with significant quenching of emission intensity in presence of the molecular oxygen (Fig. 1b), that makes them good candidates for mapping oxygen concentration in the Phosphorescence Lifetime Imaging (PLIM) experiments.

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