

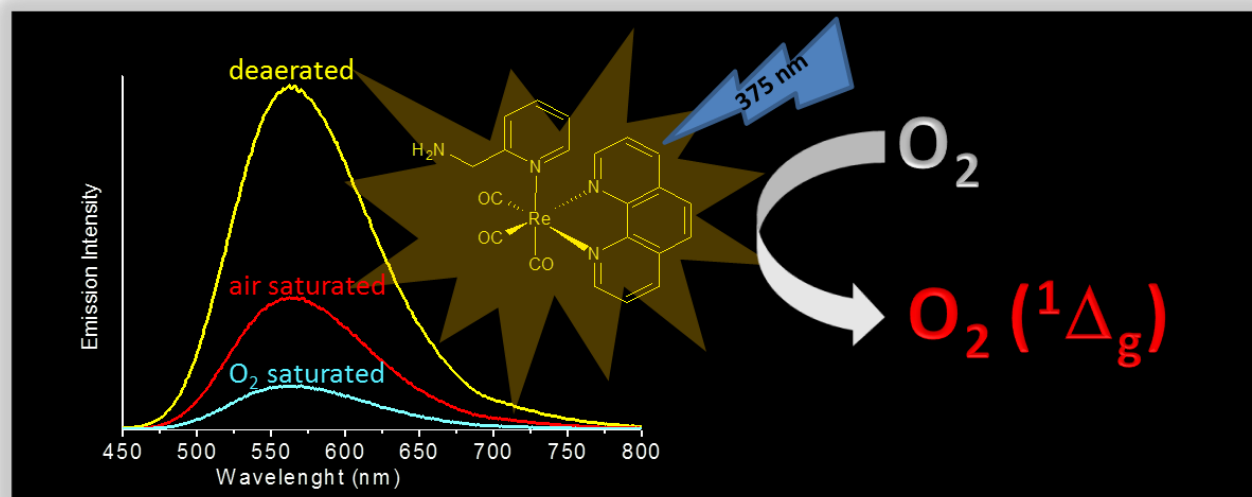
Photosensitized Generation of Singlet Oxygen from rhenium(I) complexes

Luiz Duarte Ramos, Hugo Moreira da Cruz, Karina P. Morelli Frin*

Universidade Federal do ABC - UFABC, Av. dos Estados 5001, Santo Andre-SP – Brazil - 09210-170.

*e-mail: karina.frin@ufabc.edu.br

Rhenium(I) polypyridyl complexes exhibit very interesting photophysical and photochemical properties which can be exploited in the development of biosensors and cellular probes. In this work, the *fac*-[Re(ampy)(CO)₃(NN)]⁺ complexes, ampy = 2-aminomethylpyridine, NN = 1,10-phenanthroline (phen) and 2,2'-bipyridine (bpy), were synthesized, purified and characterized by ¹H NMR, UV-vis and IR spectroscopies and photophysical properties using steady state and time-resolved emission spectroscopies were investigated. The electronic absorption spectra exhibit two main absorption bands: the higher energy band, which was assigned to IL, and the lower energy band, assigned to MLCT. Both complexes showed emission at room temperature in CH₃CN solution ($\lambda_{\text{max}} = 560$ nm, $\phi = 0.091$, $\tau = 560$ ns for *fac*-[Re(ampy)(CO)₃(phen)]⁺; $\lambda_{\text{max}} = 568$ nm, $\phi = 0.024$, $\tau = 100$ ns for *fac*-[Re(ampy)(CO)₃(bpy)]⁺) and rigid media arising from the lowest lying metal to ligand charge transfer (³MLCT_{Re→NN}) excited state. Both complexes along with *fac*-[Re(L)(CO)₃(NN)]⁺ complexes, L = Cl or pyridine, were capable of efficiently photosensitize generation of singlet oxygen with quantum yield in the range 0.59-0.28. These results highlight the potential application of *fac*-[ReL(CO)₃(NN)]⁺ complexes in the development of sensitizers for generation of singlet oxygen.



M.R. Gonçalves and K.P.M. Frin, Polyhedron, 2015, 97, 112-117.

K.P.M. Frin and V.M. Nascimento, J. Braz. Chem. Soc. 2016, 27, 179-185.

L.D. Ramos, R.N. Sampaio, F.F. de Assis, K.T. de Oliveira, P. Homen-de-Melo, A.O.T. Patrocínio, K.P.M. Frin, Dalton Trans., in press.

FAPESP and CAPES for financial support.