Aminobutyl triscyclometalated iridium complexes for cell imaging

Sureemas Meksawangwong, Filip Kielar

1Department of Chemistry, Faculty of Science, Naresuan University, Muang, Phitsanulok 65000, Thailand
2Center of Excellence in Biomaterials, Naresuan University, Muang, Phitsanulok 65000, Thailand
*E-mail: filipk@nu.ac.th

Abstract: Luminescent iridium complexes are interesting compounds with potential applications in several areas such as cellular imaging, OLEDs, or photoredox catalysis. Our research in this area focuses on the development of simple derivatives of the prototypical triscyclometalated iridium complex $\text{fac-}[\text{Ir(ppy)}_3]$ for the purpose of cell imaging. An example of such derivative is the aminobutyl triscyclometalated iridium complex $[\text{Ir(ppy)}_2\text{ppy-NC}_4]$ (1) previously shown by our group to be suitable for cell imaging. Herein we report the extension of this work focused on the synthesis and investigation of the quarternary ammonium analogue (2) of this iridium complex. The photophysical properties of two complexes were investigated using UV-Vis, steady state photoluminescence, and time-resolved photoluminescence techniques. The results indicate that the complexes are highly emissive, possessing long luminescence lifetimes (up to 1.5 $\mu$s) and high quantum yields (~40 %). The potential for the use of these complexes for cellular imaging has been evaluated using fluorescence microscopy with live NIH-3T3 cells.

Keywords: Aminoalkyl; Imaging; Iridium; Luminescence