

## Luminescent Materials for Light-Emitting Electrochemical Cells

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Light-Emitting Electrochemical Cells (LECs) are a new concept of flat and flexible electroluminescent devices, having a much simpler architecture compared to that of the well-known Organic Light-Emitting Diodes (OLEDs) [1]. Therefore, in the future, LECs are expected to be a viable low-cost alternative to the OLED technology already on the market. In this talk, I will present our main results in the development and characterization of emitting materials for LECs, accomplished with the help of computational modeling and advanced spectroscopic techniques. The first part of the presentation will be focused on cationic cyclometalated iridium(III) complexes as active materials in LECs [2]. In the second part, I will introduce cationic copper(I) complexes as a potential alternative to iridium(III) counterparts [3]. Iridium, in fact, is one of the rarest elements on the Earth crust and, therefore basing a large-scale lighting industry on this metal might be unrealistic. Copper, on the contrary, is much more abundant and cheaper, but exhibits several drawbacks if used as metal center for luminescent complexes, such as limited color tunability and low stability in the devices.

[1] (a) <https://www.cello-project.eu/> (b) *Angew. Chem., Int. Ed.*, 2012, 51, 8178.

[2] (a) *Inorg. Chem.*, 2012, 51, 2263; (b) *Inorg. Chem.*, 2013, 52, 10292; (c) *Inorg. Chem.*, 2014, 53, 7709; (d) *Inorg. Chem.*, 2015, 54, 3031; (e) *Faraday Discuss.*, 2015, 185, 233; (f) *Inorg. Chem.*, 2016, 55, 7919; (g) *Inorg. Chem.*, 2017, 56, 10584.

[3] (a) *Inorg. Chem.*, 2013, 52, 12140; (b) *Chem. Eur. J.*, 2014, 20, 12083; (c) *Polyhedron*, 2014, 82, 158; (d) *Dalton Trans.*, 2016, 45, 17939.

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