

Phthalocyanines: wonderful yet perfectible molecular materials

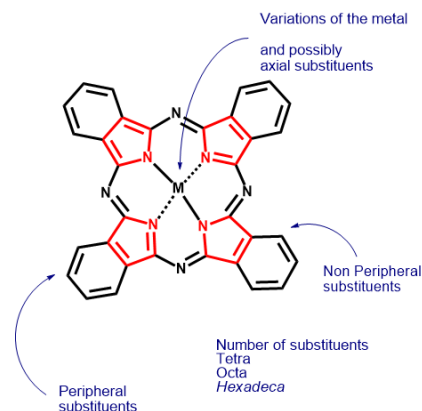
Fabienne Dumoulin

Acıbadem Mehmet Ali Aydınlar University, Faculty of Engineering and Natural Sciences, Biomedical Engineering Department, Ataşehir, İstanbul, Türkiye.

Phthalocyanines are used in a wide range of applications, from photodynamic therapy [1] and (bio)sensors [2] to the catalysis of carbon dioxide reduction [3] or methane oxidation [4]. Amongst others, such as cardiac rhythm photomodulation [5].

There are tens of thousands phthalocyanine structures reported, as their skeleton allows for nearly infinite structural variations (see figure). Yet the question arises sometimes about the relevance of making some more.

After a presentation of our latest works, the future of research involving phthalocyanines will be discussed.



References

- [1] Pui-Chi Lo, M. Salomé Rodríguez-Morgade, Dennis K. P. Ng*, Tomas Torres*, Ravindra Pandey* and Fabienne Dumoulin*, *Chemical Society Reviews*, **2020**, 49, 1041-1056
- [2] Çiğdem Yağcı, Oluwatoyin Emmanuel Aina, Atefeh Emami, Amal Ibijbijen, Diana Dragoe, Haifa Ben Aziza, Ümit İşci, Abdelhamid Errachid, Nicole Jaffrezic Renault, Fabienne Dumoulin, Hafsa Korri-Youssoufi, *Inorg. Chem.* **2025**, 64, 13740–13751
- [3] Min Wang, Kristian Torbensen, Danielle Salvatore, Shaoxuan Ren, Dorian Joulié, Fabienne Dumoulin, Daniela Mendoza, Benedikt Lassalle-Kaiser, Umit İşci, Curtis Berlinguette, Marc Robert, *Nature Communications*, **2019**, 10, 3602
- [4] Ümit İşci, Abayomi S. Faponle, Pavel Afanasiev, Florian Albrieux, Valérie Briois, Vefa Ahsen, Fabienne Dumoulin*, Alexander B. Sorokin* and Sam P. de Visser*, *Chem. Sci.* **2015**, 6, 5063–5075
- [5] Lukas Naimovičius, Mila Miroshnichenko, Ekin Opar, Helen Hölzel, Masa-aki Morikawa, Nobuo Kimizuka, Manvydas Dapkevičius, Justas Lekavičius, Edvinas Radiunas, Karolis Kazlauskas, Víctor Cilleros-Mañé, Fabio Riefolo, Carlo Matera, Kevser Harmandar, Masahiko Taniguchi, Fabienne Dumoulin, Jonathan S. Lindsey, Pankaj Bharmoria, Pau Gorostiza, Kasper Moth-Poulsen, *Nature Commun.*, **2025**, 16, 6377.