Lithium phthalocyanine - molecular oxygen sensor

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Lithium phthalocyanine is a dissolved oxygen sensor [1]. The primary field of application is the measurement of dissolved oxygen in tissues, tumors, 3D cell cultures (e.g., spheroids), or cells. Sensors are biocompatible and stable in biological conditions, being insoluble in water, which makes them an ideal system for long-term monitoring of oxygen levels.

Molecular oxygen sensors for dissolved oxygen (pO_2) are crucial for biological and medical applications. Changes in oxygen levels can be a marker of general inflammatory processes, misbuilding of blood vessels, poor diffusion geometry, and other severe abnormalities in tissues (e.g., tumors). Additionally, medical treatment can be dependent on pO_2 levels, for example, radiological anticancer therapy.

The principle of operation is based on the detection of magnetic field fluctuations caused by the O_2 molecules around the radical. Such fluctuations cause EPR line broadening, which can be calibrated and quantified for EPR oximetry.

Keywords: Lithium phthalocyanine, oxygen sensor, EPR, radicals

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References

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