

New paramagnetic probes and singlet oxygen formation in cells

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Paramagnetic oximetric probes have been examined in exemplary nasal polyps cells irradiated by laser without and with photosensitizer – chlorine e6. Laser irradiation causes excitation of oxygen O_2 from triplet to singlet state. Singlet oxygen damages pathological cells. The knowledge of singlet oxygen formation is important to determine the conditions of laser therapy. In this work new probes for oximetry in medicine have been proposed. As potential oximetric probes, coal samples thermally treated at temperatures ($^{\circ}C$): 400, 500, 600, and 700, have been tested in cell cultures. In this study we used electron paramagnetic resonance (EPR) spectroscopy as the experimental technique. EPR spectrum of the oximetric probe should strongly depend on the amount of paramagnetic triplet oxygen molecules O_2 in cell cultures. It was proved that EPR spectrum of coal carbonized at $600^{\circ}C$ is susceptible to paramagnetic O_2 molecules and it may be used in oximetry.