

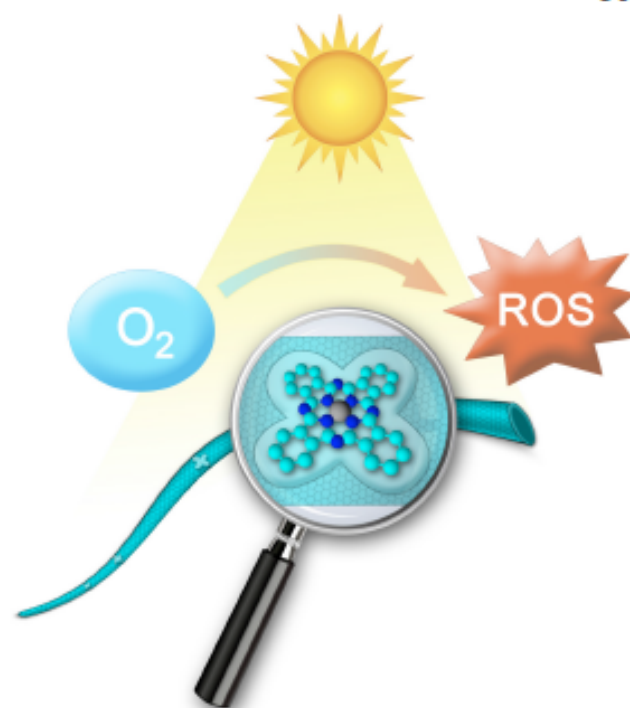


## Smart Polyurethane Nanofibers

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An aromatic macrocyclic compound, phthalocyanine (PC) and its polymeric derivatives<sup>1</sup> have caught vivid attention of scientists since '60s thanks to their interesting properties such as thermal stability, semiconductivity<sup>2</sup>,



photoconductivity<sup>3</sup> and catalytic activity<sup>4</sup>. There is a wide range of PC-containing polymers, in which PC-units are embedded covalently or through non-covalent interactions<sup>5</sup>. PC fixed within polymer is advantageous due to its readily separation and recycling. However, covalent linkage of PC within polymer requires more sophisticated pathways either via suitable central metal atom complexed in the centre of the macrocycle, which forms axial polymeric linkages<sup>6</sup> or reactive groups jutting out of macrocycle capable of polymerization<sup>7</sup>.

Herein, we present novel approach giving rise to doubly hydroxylated PC-macrocycles complementary for covalent modification of polyurethane polymers (PUR, Figure 1). Resulting PUR can be easily adjusted for certain applications by proper choice of diisocyanate or diol monomers and polymerization conditions. Particularly, we focused on smart PUR nanofibers functionalized by PC. These nanofibers manifest their properties as efficient photosensitizers of relevant reaction partners such as oxygen, finding potential use in self-cleaning materials and photomedicine.

**Figure 1.** Schematic representation of polyurethane nanofiber functionalized by phthalocyanine operating as photosensitizer for molecular oxygen, producing reactive oxygen species (ROS).

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