# Thioxanthone Dioxides: Synthesis, Photophysical and Photochemical Characterization

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Photoinitiators are critical components of photopolymerization formulations, allowing for effective initiation, control over curing kinetics, compatibility with multiple systems, adaptability, energy efficiency, and spatial/temporal control. Their importance stems from their capacity to accelerate the creation of sophisticated materials and enable novel applications in industries such as adhesives, coatings, electronics, 3D printing, and biomedical engineering.

Bond cleavage (type I) and H-abstraction type (type II) initiators can be used for photoinitiated radical polymerization. Thioxanthone (TX) and derivatives are among the most widely used Type II photoinitiators in various UV curing applications because of their excellent light absorption characteristics. In most cases, the polymerization-initiating free radicals are generated by hydrogen abstraction of the triplet excited state of TX from hydrogen donors such as amines or thiols.

The oxidized derivatives of TX, thioxanthen-9-one-10,10-dioxide derivatives, show biological activities including anti-tumor, anti-allergic, and monoamine oxidase (MAO) inhibitory activity and a wide range of pharmacological properties. However, only few studies of their photophysics and photochemistry have been published. Here we report the photochemical and photophysical properties of a series of TX-Dioxide derivatives and their use as photoinitiators for polymerization and in-situ prepared gold /silver nanoparticles in polymer matrix [1,2].

References

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