

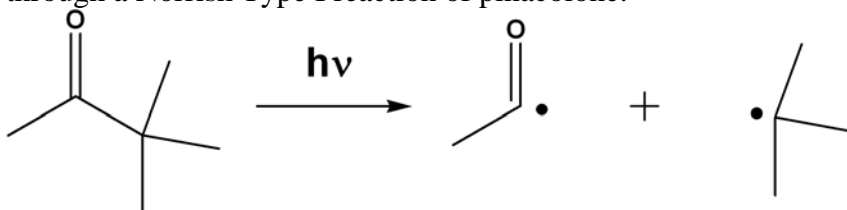
## Photochemical Reactions of Organic Substrates on Monolayer-Protected Gold Nanoparticles

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We are interested in a study of monolayer-protected gold nanoparticles (MPGNs). The gold cores are encapsulated by organic thiols with long carbon chains. Different functional groups can be incorporated onto the ligands and placed on the gold centers using three different methods: direct method, place exchange, and by  $S_N2$  reaction with Bromide MPGN. The release of ligands can be achieved by generating a radical pair through a Norrish Type I reaction of pinacolone.



In this study, nanoparticles 2.2 nm in diameter were synthesized and partially functionalized with three different functional groups – TEMPO radical, anthracene, and cinnamyl groups. Functionalization with TEMPO radical was done via  $S_N2$  reaction with Bromide MPGN and confirmed by cyclic voltametry. Anthracene ligands were also incorporated onto the gold centers by  $S_N2$  reaction with Bromide MPGN, released in the presence of radical source and followed by its fluorescence. Partially functionalized cinnamyl MPGN was synthesized using place exchange method with base MPGN, and [2+2] photodimerization of the functional group was investigated.