

Arylation of trialkyl phosphites via visible light two-photon photoredox catalysis

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A consecutive two-photon process was applied to develop a novel method for the formation of aryl phosphonates^[1] By the usage of the high reduction potential of the consecutively generated excited Rhodamine 6G radical anion^[2] aryl halides and aryl triflates were reduced to the respective aryl radicals and then trapped by various phosphite esters, to form a broad range of aryl phosphonates at ambient temperature. A proposed mechanism for this metal-free, visible light induced photo-Arbuzov reaction is shown in Fig. 1.

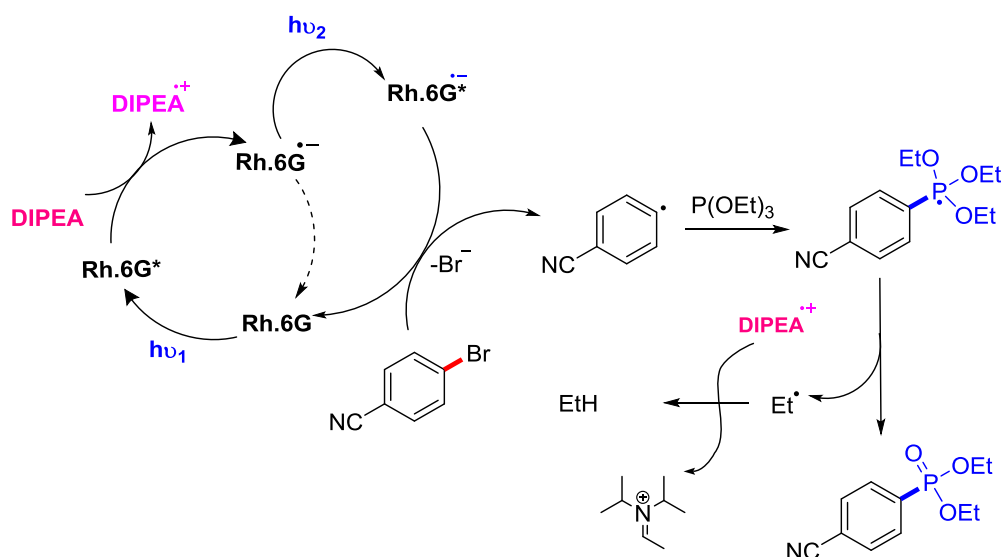


Figure 1. Proposed mechanism for the visible light induced photo-Arbuzov reaction

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References:

- [1] R. S. Shaikh, S. J. S. Düsel, B. König, *ACS Catalysis*, **2016**, 6, 8410
 [2] I. Ghosh, T. Ghosh, J. I. Bardagi, B. König, *Science*, **2014**, 346, 725