Photocycloadditions with Lignin Derived Aromatic Compounds

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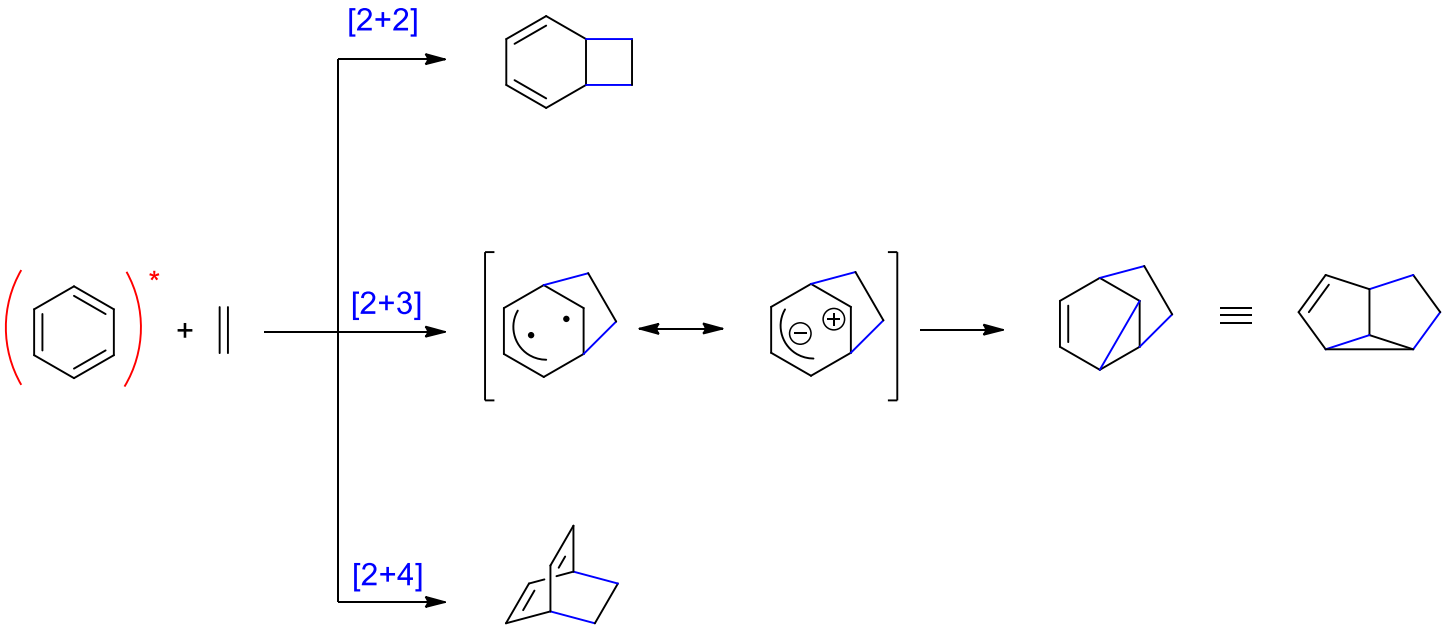
Photocycloadditions of aromatic compounds



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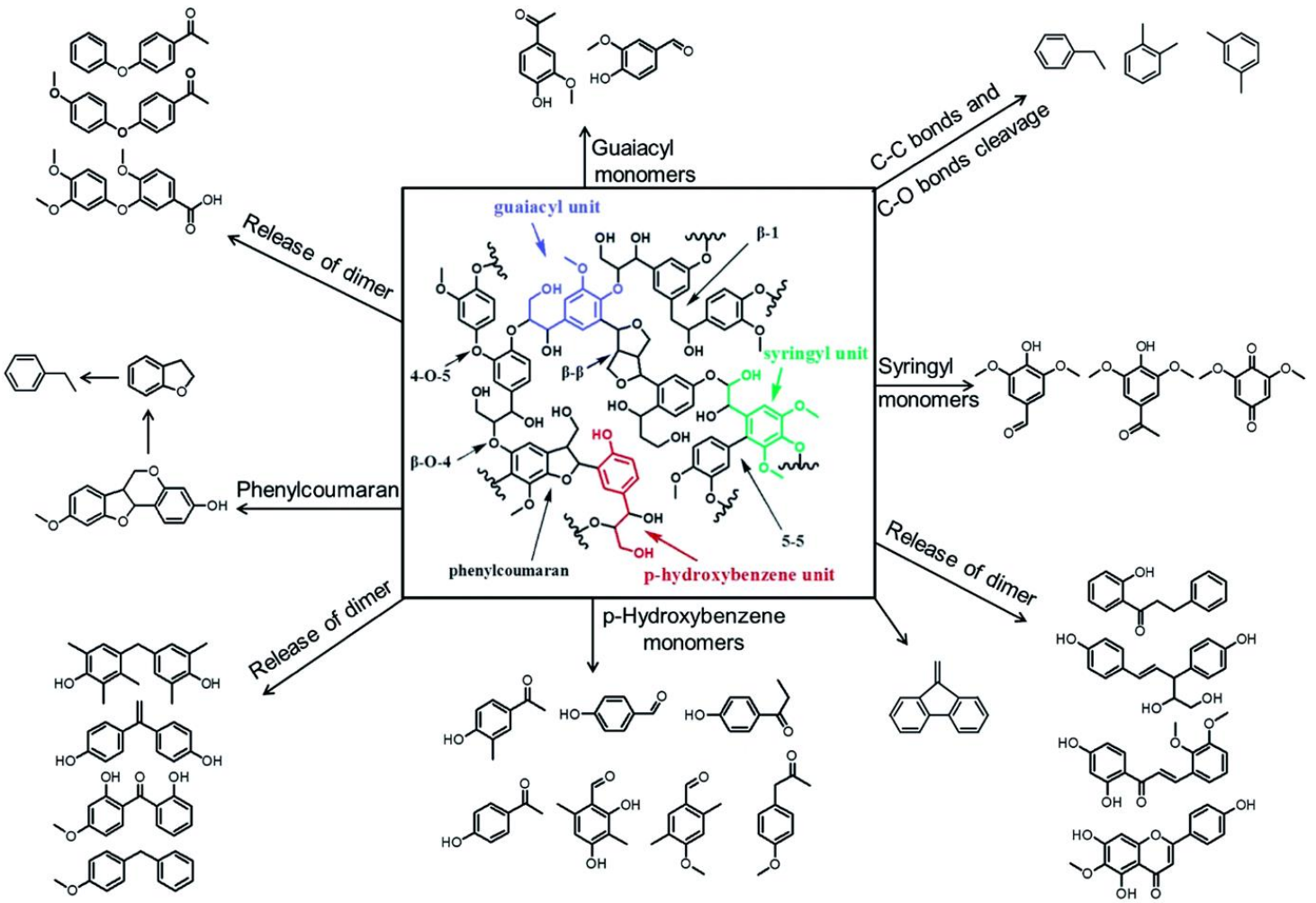

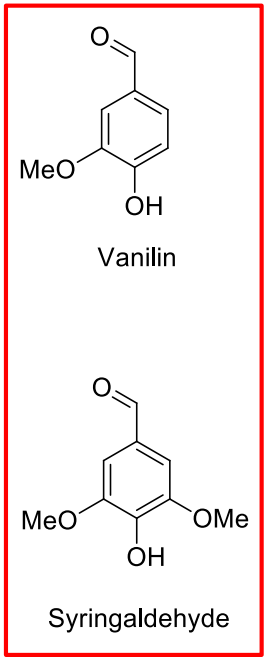

H. Zhu, Y. Chen, T. Qin, L. Wang, Y. Tang, Y. Sun, P. Wan, *RSC Adv.* **2014**, *4*, 6232

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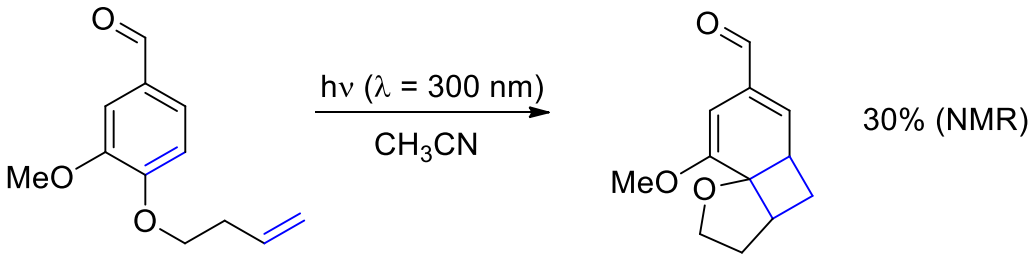

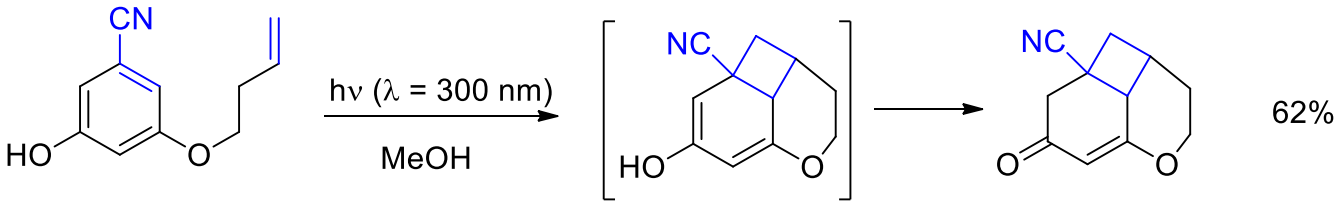

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A. Desvals, S. A. Baudron, V. Bulach, N. Hoffmann, *J. Org. Chem.* **2021**, *86*, 13310

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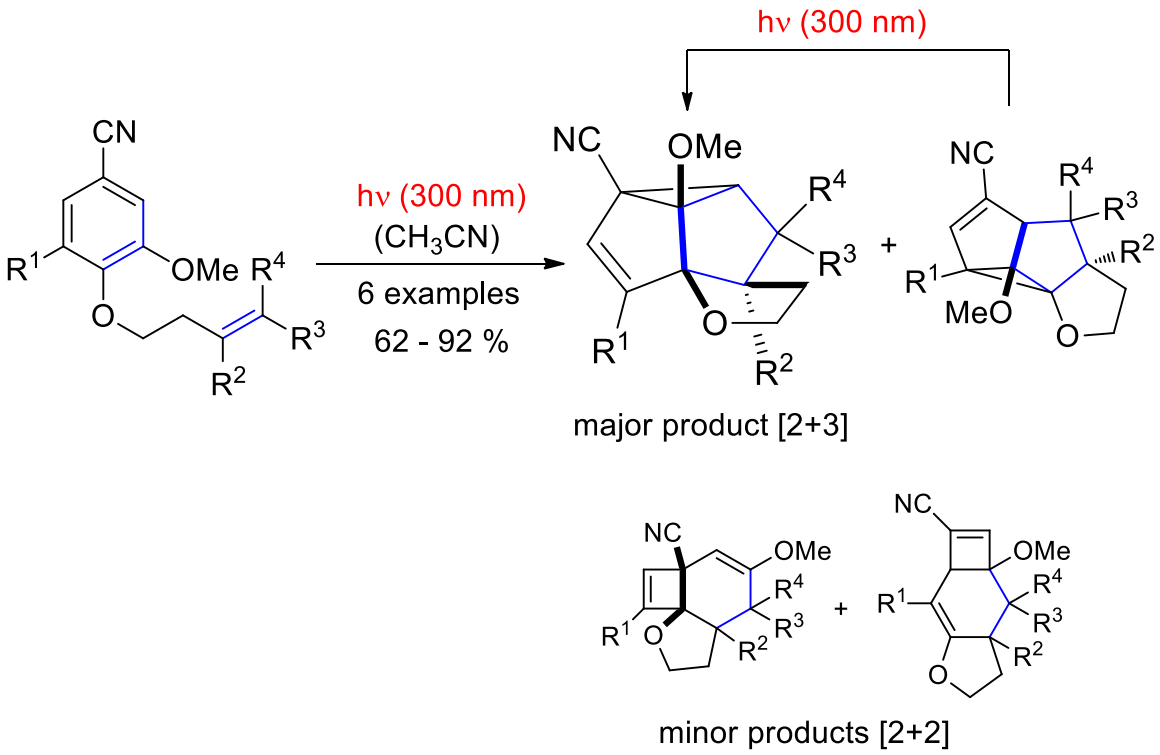

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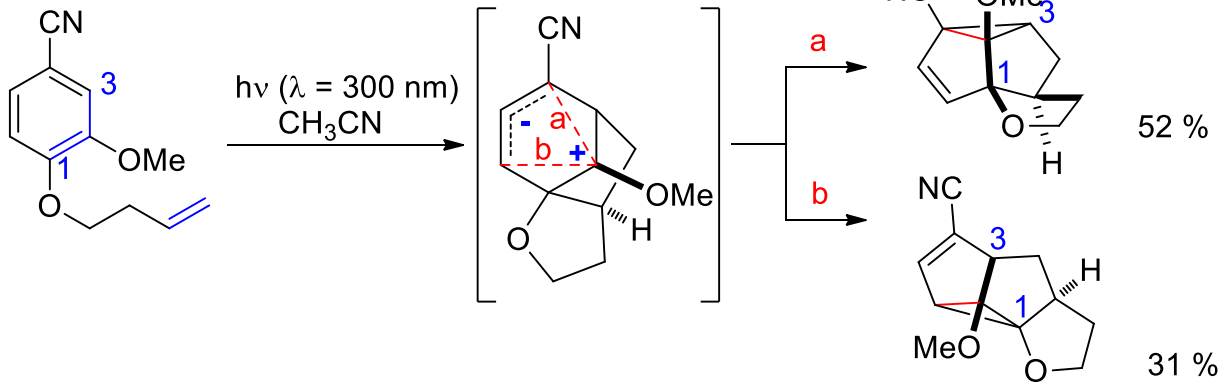
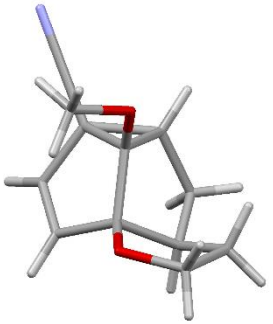
Photocycloadditions of aromatic compounds

Major products ([2+3]-photocycloaddition)





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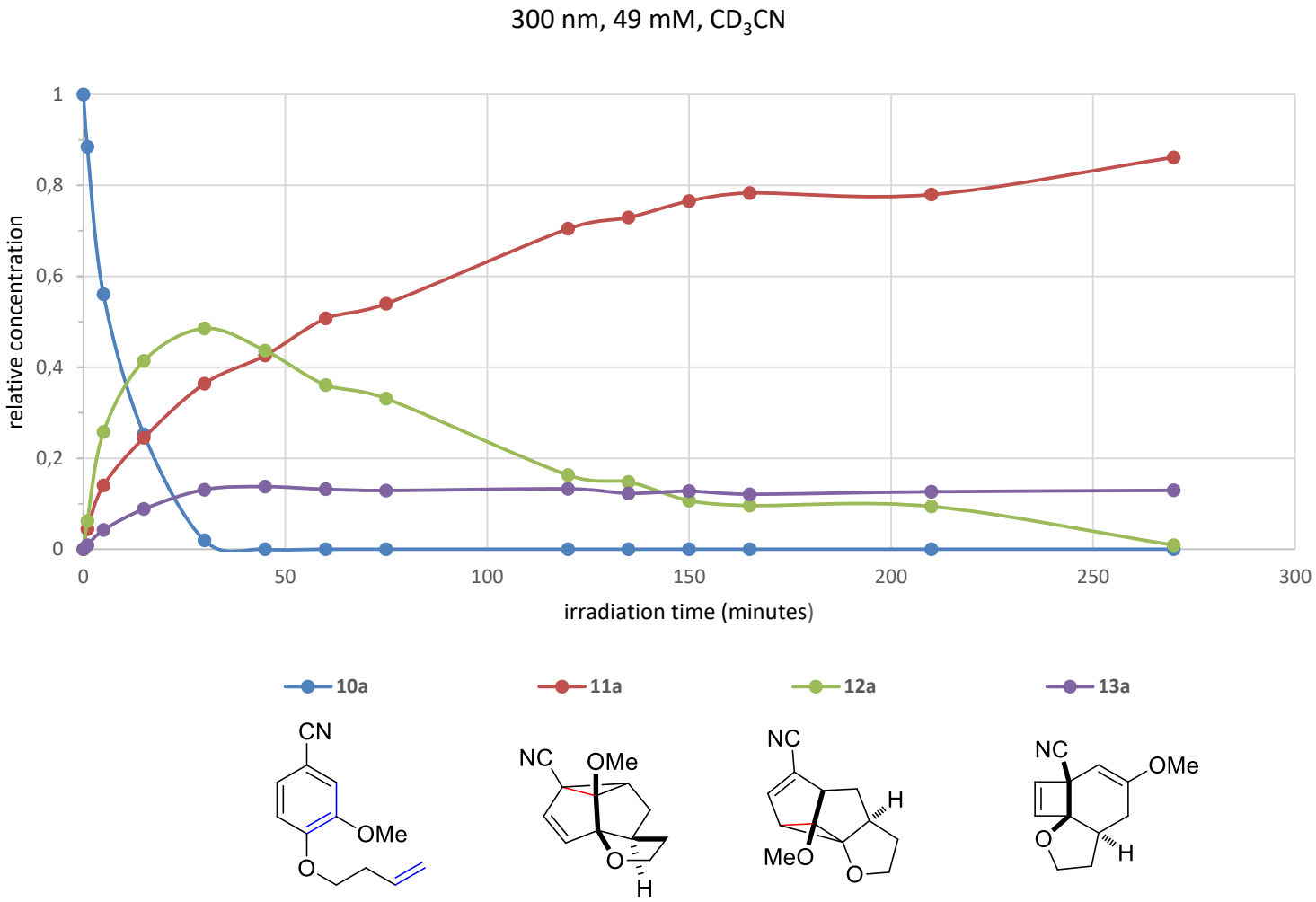

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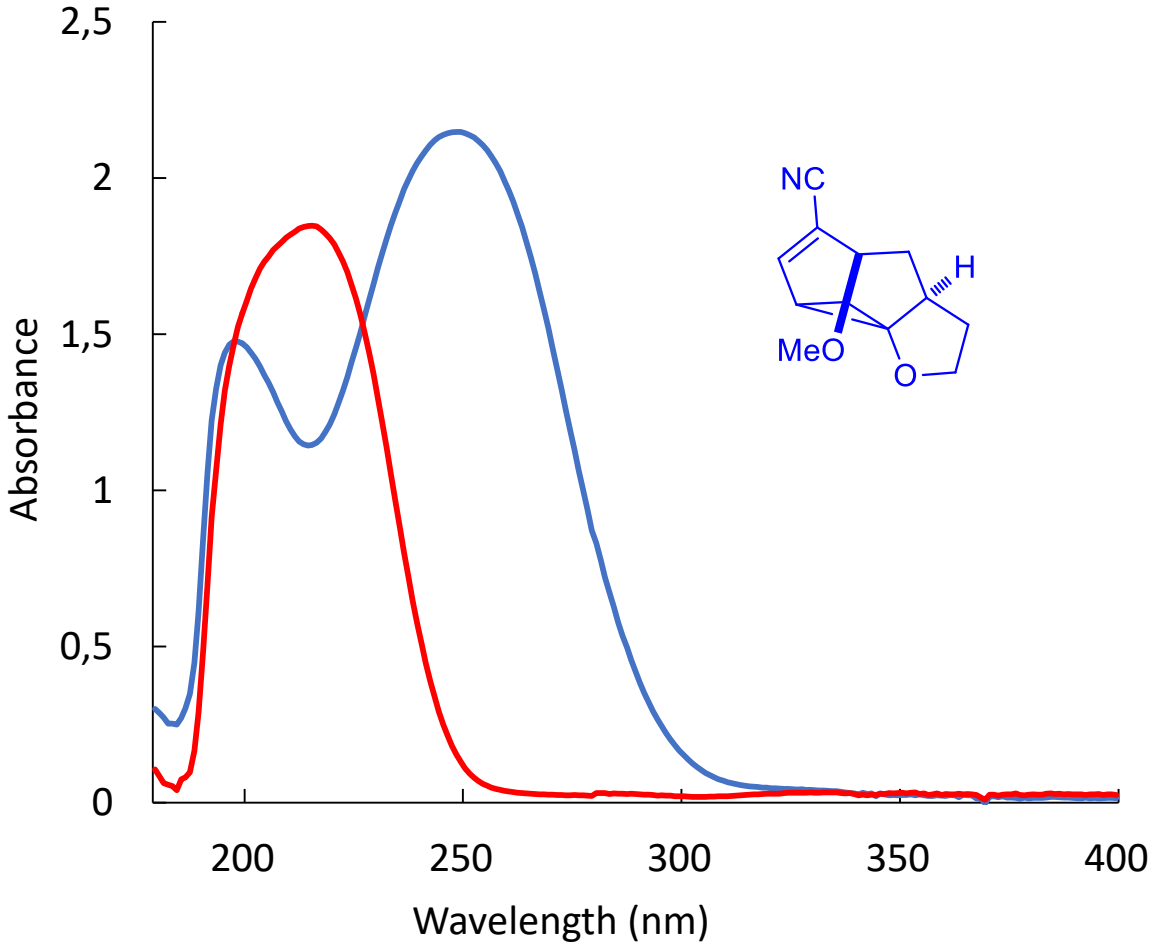

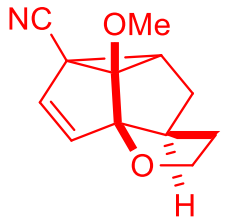

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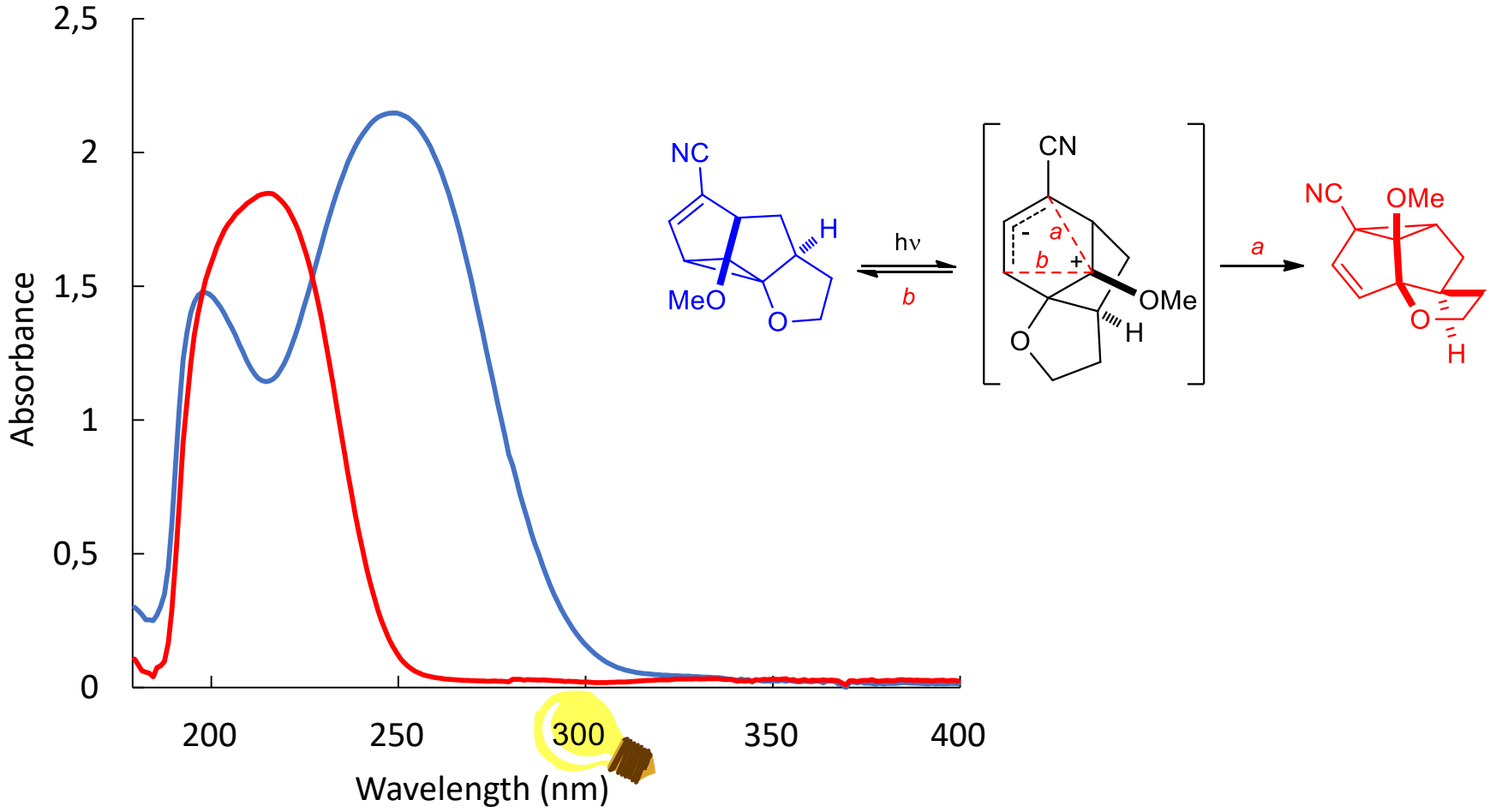

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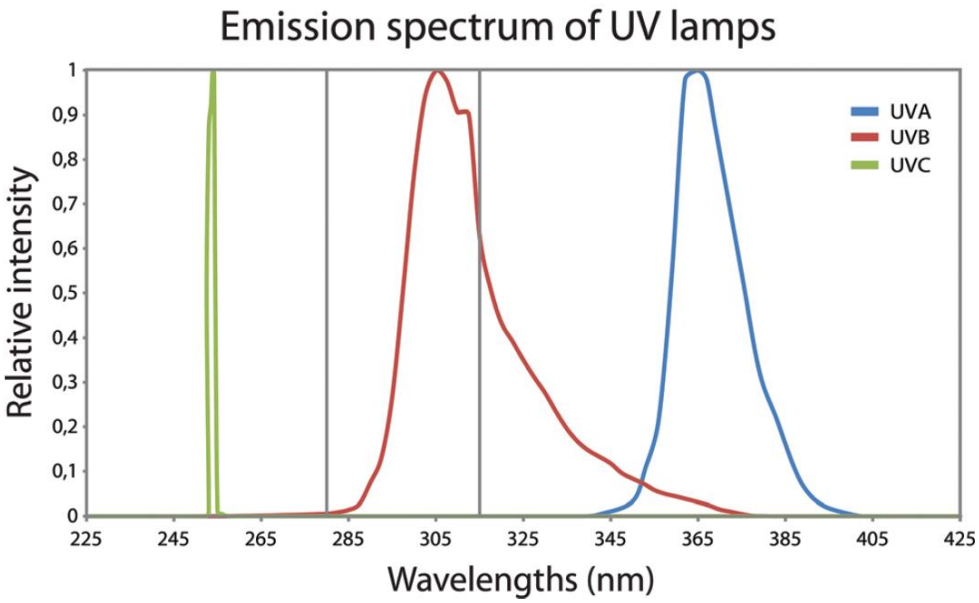
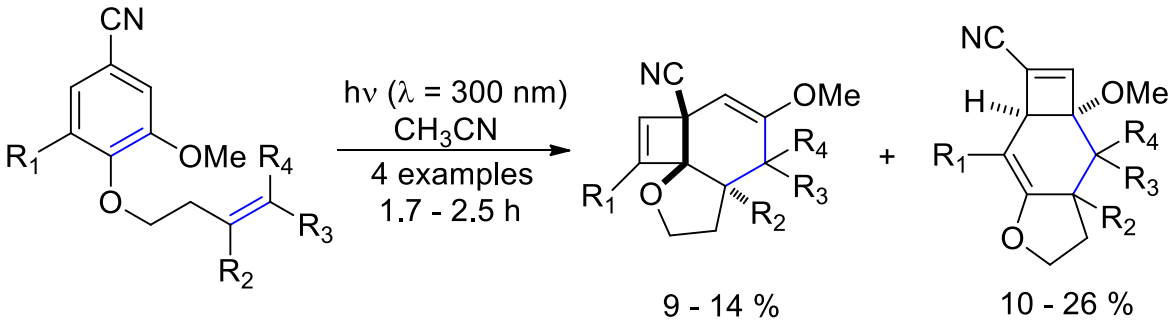


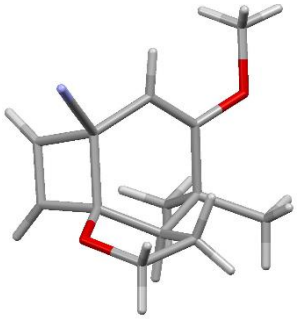
Emission spectrum of the different UV lamps. UVA, UVB and UVC irradiations were performed with B100 (UVP), RPR-3000 (Southern New England Ultraviolet Co.) and BLE-8T254 (Spectronics Corporation) lamps, respectively. The spectra were derived from manufacturer's specifications and modified according to measurements made using an International Light double monochromator spectroradiometer (IL7000/760D/790).

J. D. Mallet, P. J. Rochette, *Photochem. Photobiol. Sci.* **2013**, *12*, 1310

Photocycloadditions of aromatic compounds

Minor products ([2+2]-photocycloaddition)





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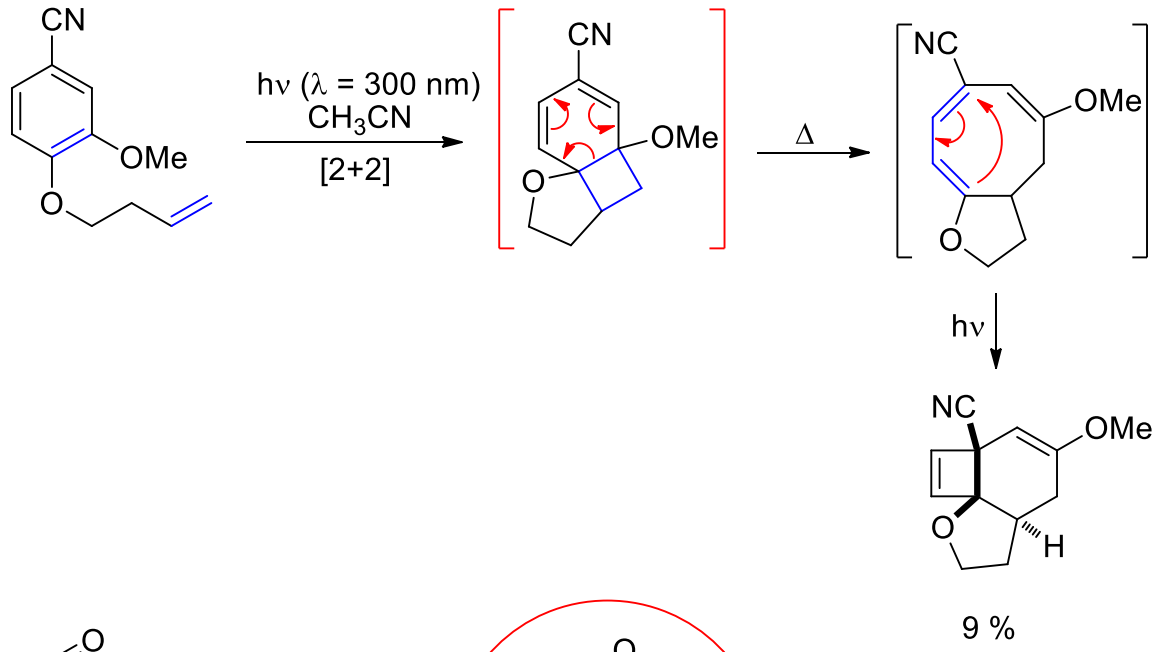
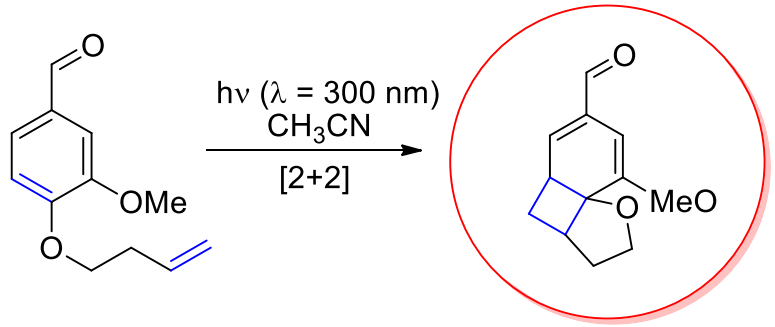


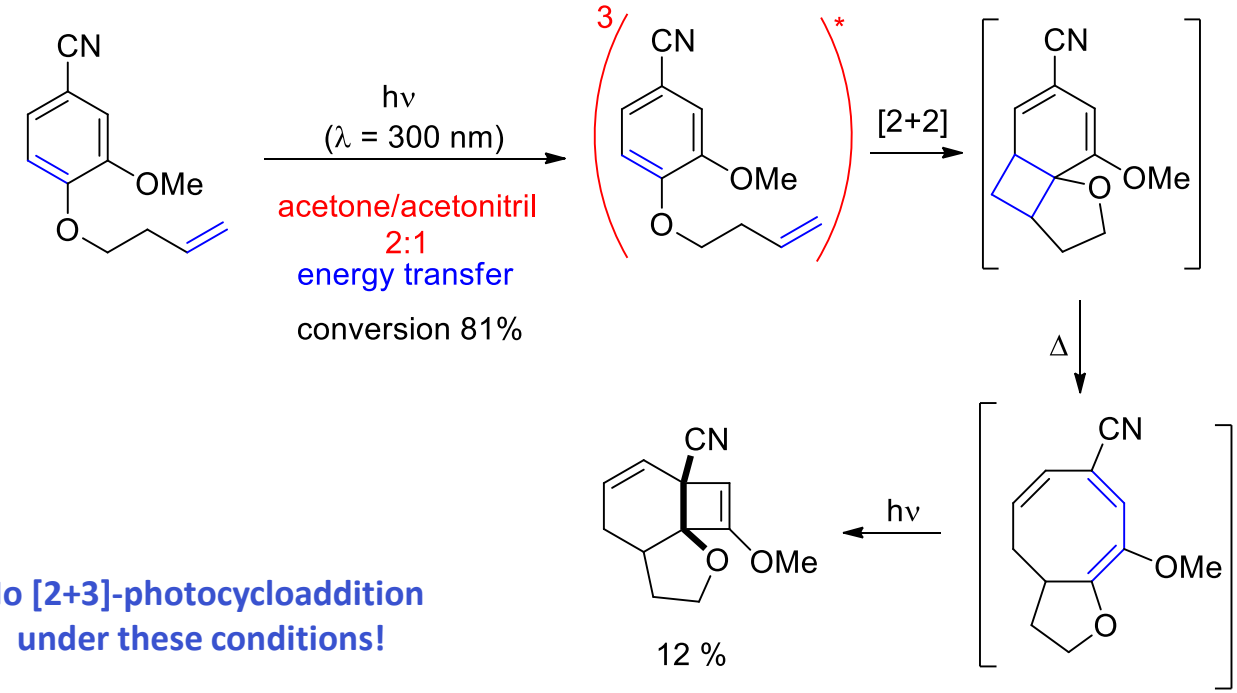
Singlet reaction as the [2+3] photocycloaddition



Triplet reaction

Photocycloadditions of aromatic compounds

Triplet sensitized [2+2]-photocycloaddition



No [2+3]-photocycloaddition under these conditions!

A. Desvals, S. A. Baudron, V. Bulach, N. Hoffmann, *J. Org. Chem.* **2021**, *86*, 13310.

A. Desvals, N. Hoffmann, *Aust. J. Org. Chem.* **2023**, *76*, 117.

Conclusions

Lignin is an important renewable source for aromatic compounds.

Intramolecular photocycloadditions can be carried out with compounds possessing electron donor and electron acceptor substituents on the aromatic moiety (e.g. vanillin).

Unexpectedly, [2+3] photocycloadditiosns with benzonitrile derivatives take place at the singlet state. Minor products results mainly from [2+2]-photocycloaddition.

[2+2]-photocycloadditions at the triplet state are less efficient with these compounds and the regioselectivity is different.

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