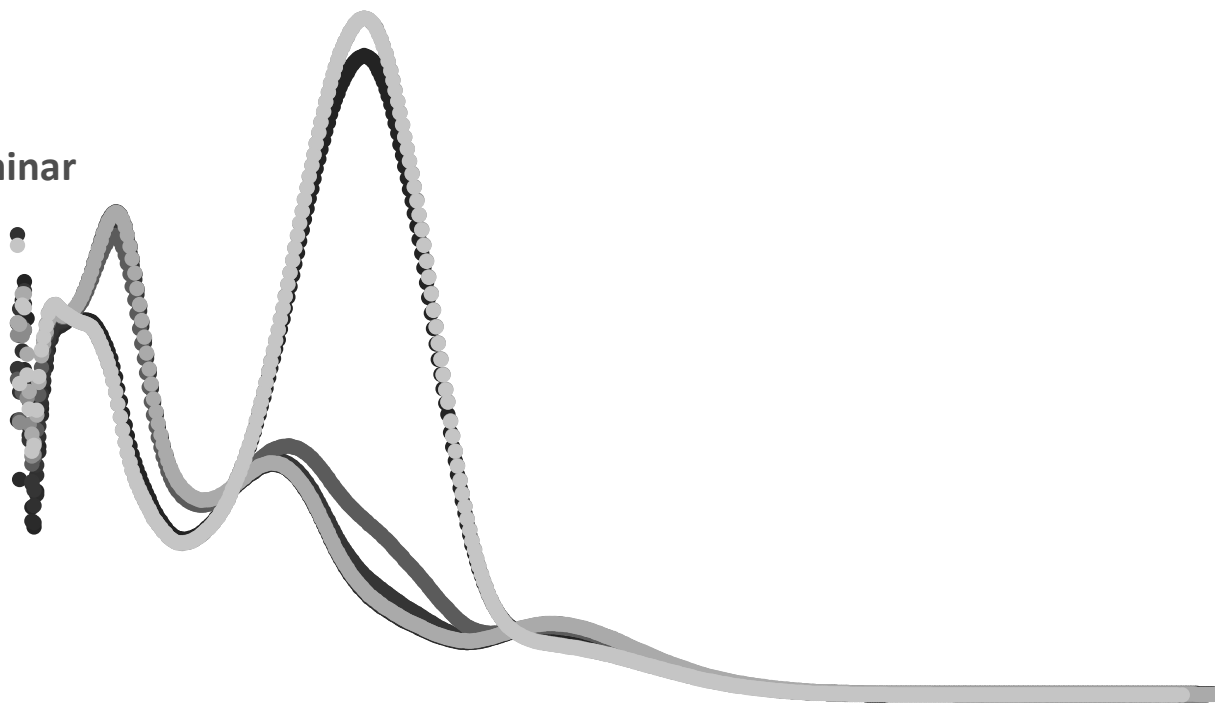


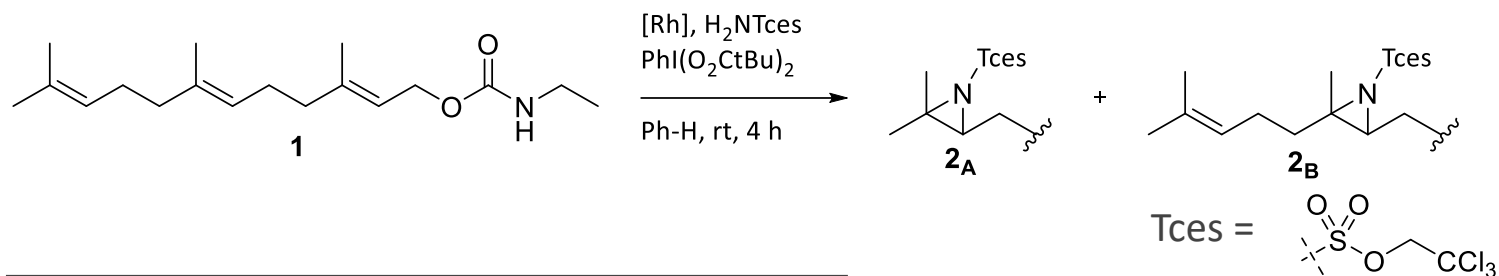
Design and Synthesis of Azobenzene based Catalysts

05.02.2021

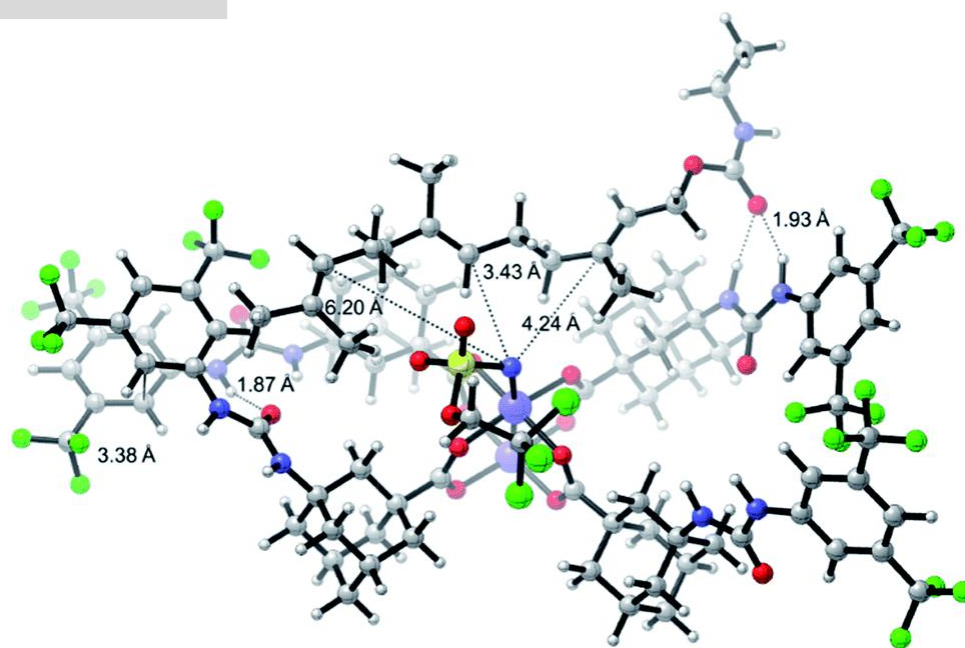
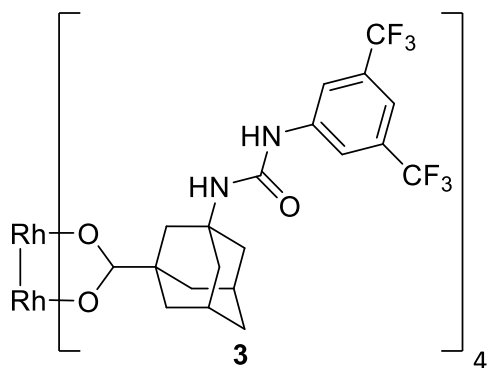
Christopher Topp, Group seminar

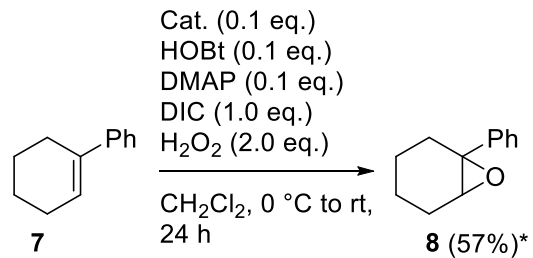
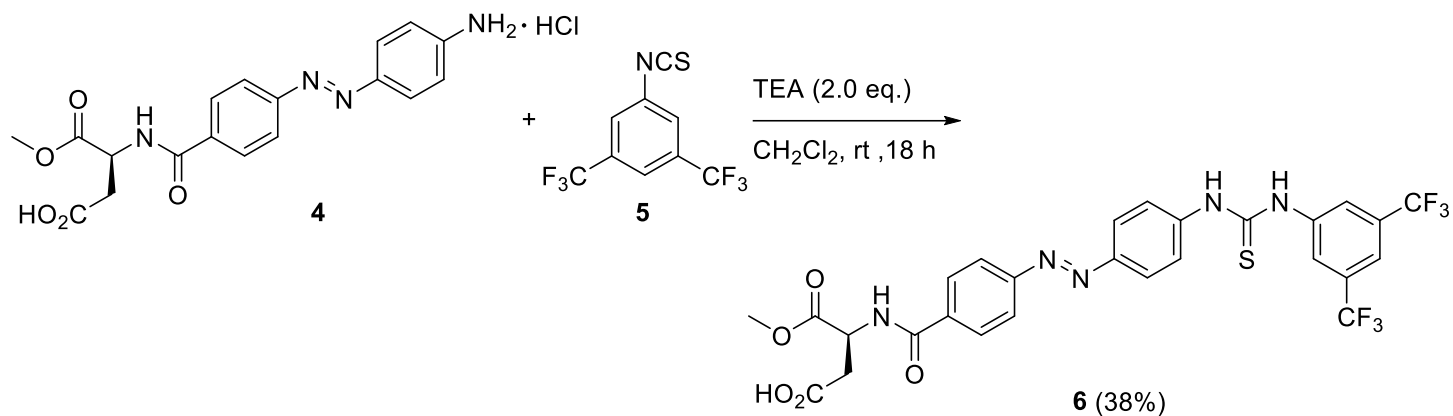
*Institute of Organic Chemistry
Justus-Liebig-University
35392 Giessen, Germany*



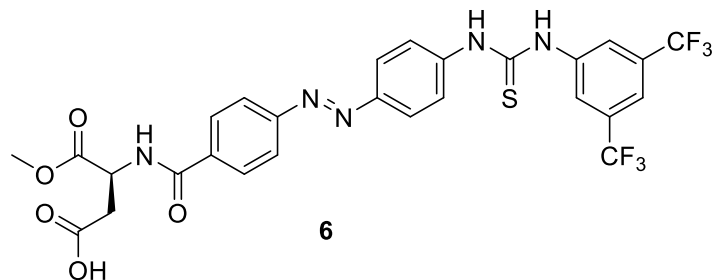


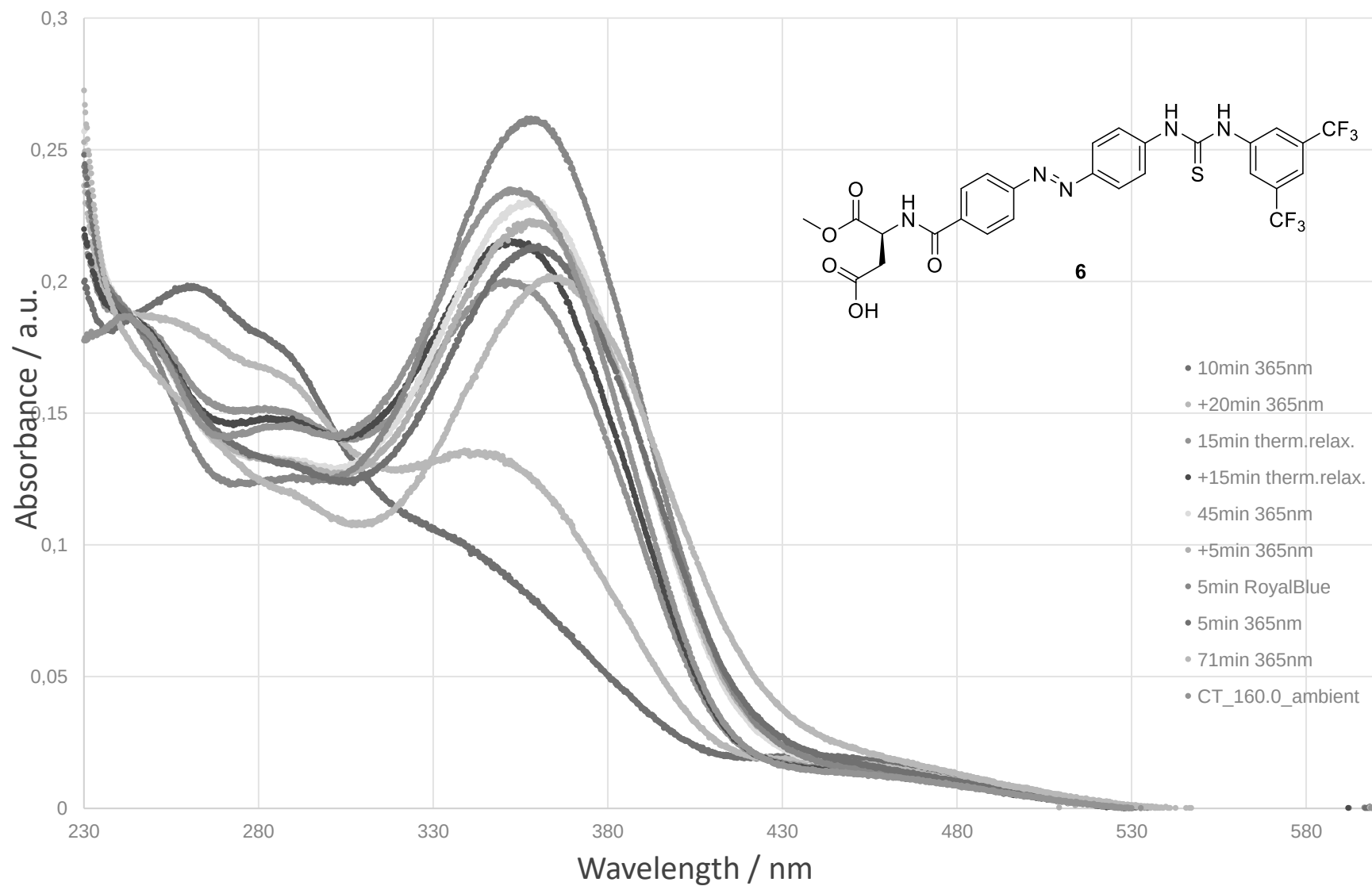
Catalyst	$2_{\text{A}} : 2_{\text{B}}$	Yield ($2_{\text{A}} : 2_{\text{B}}$) / %	Conversion (1) / %
$\text{Rh}_2(\text{esp})_2$	2.0 : 1.0	29	81
3	1.0 : 1.9	31	80

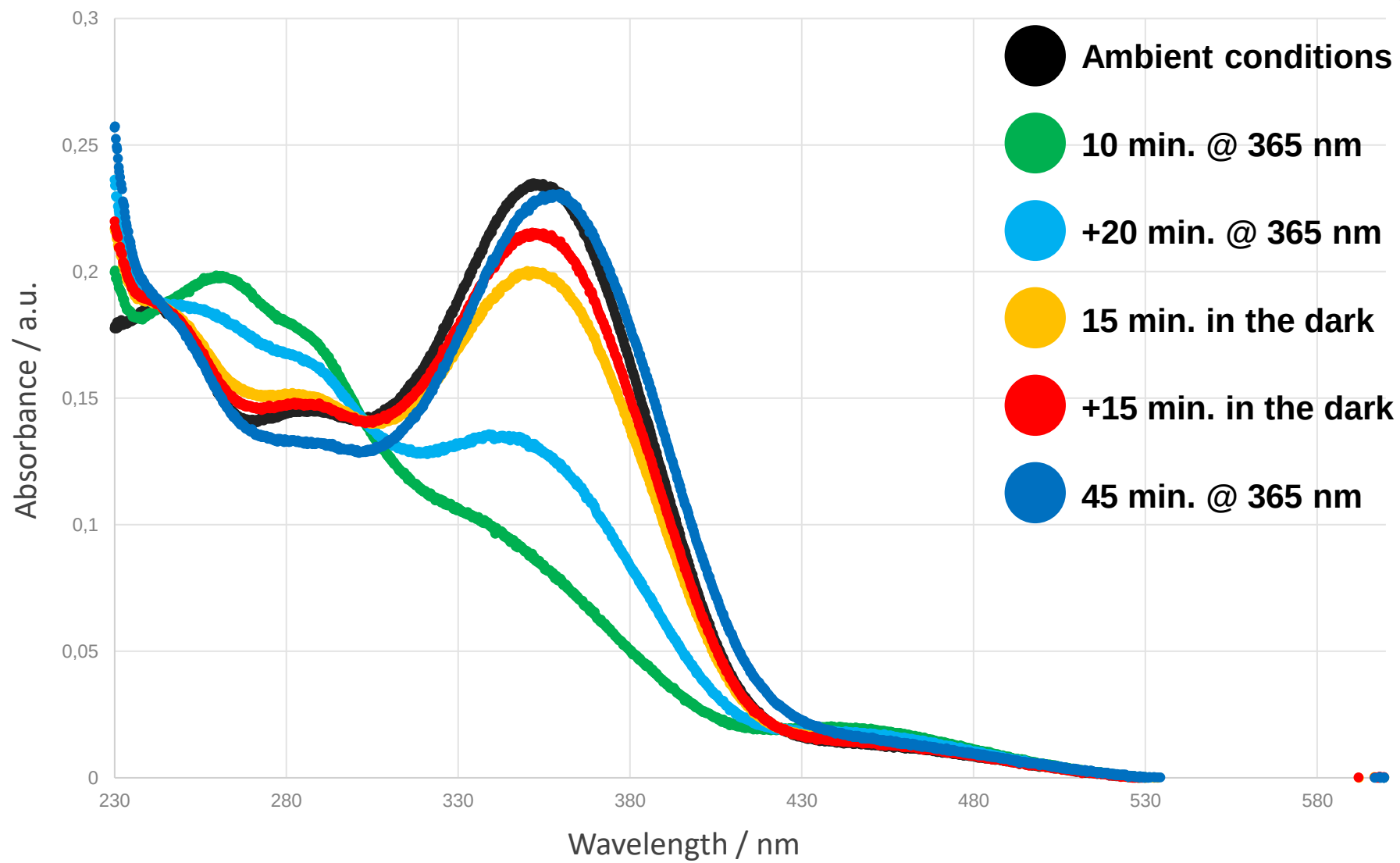


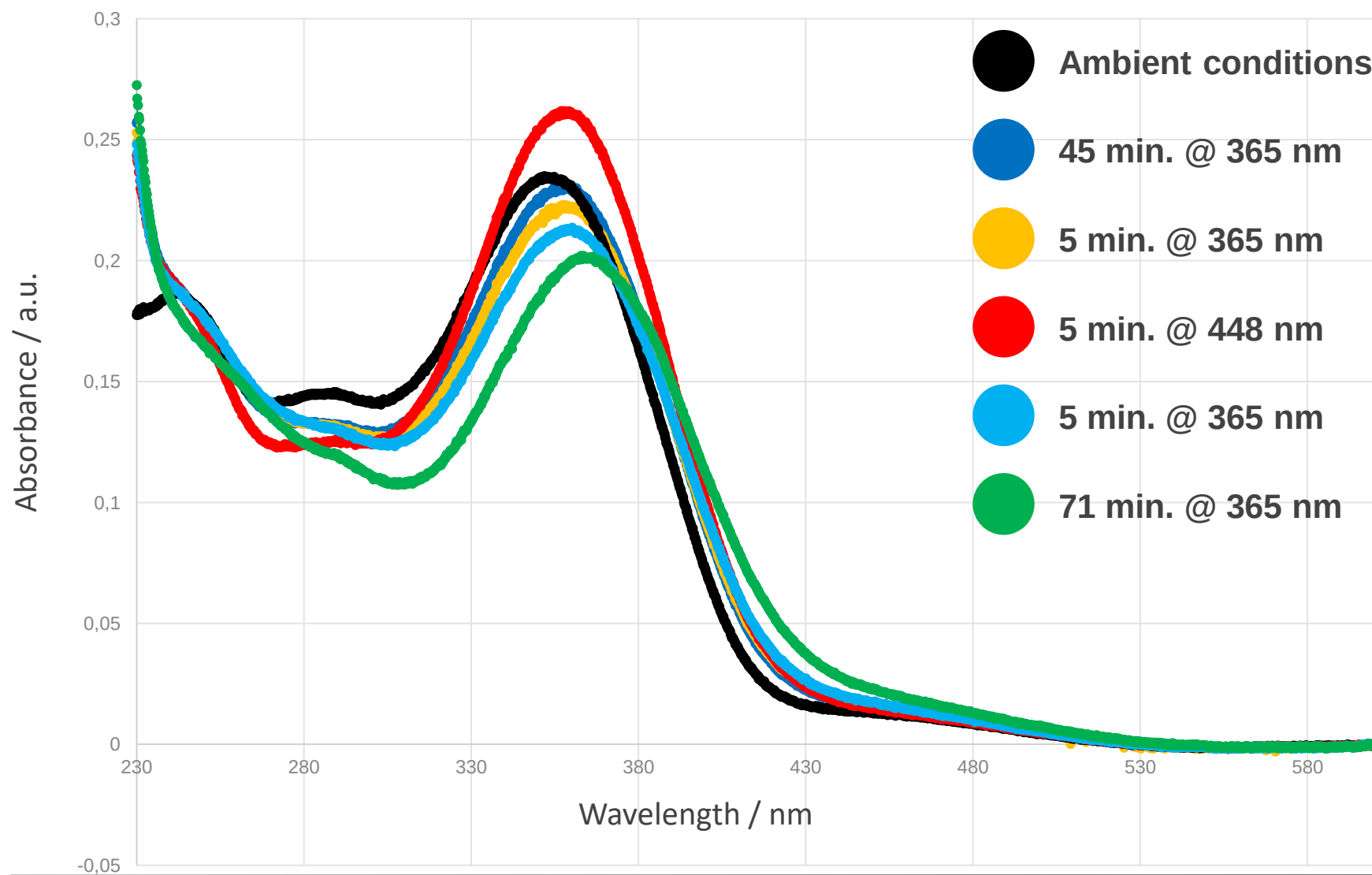


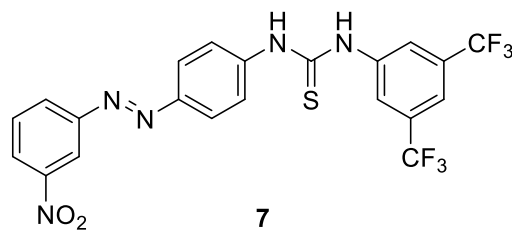
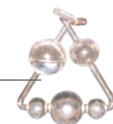
*Determined via $^1\text{H-NMR}$











4.4. Compound V

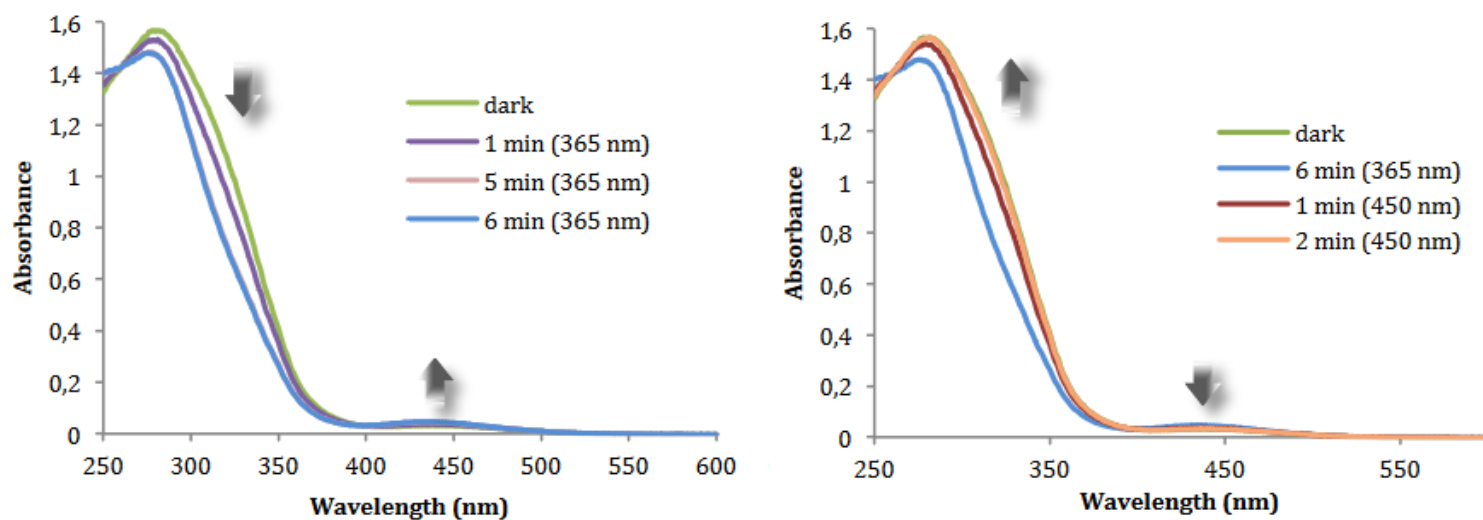
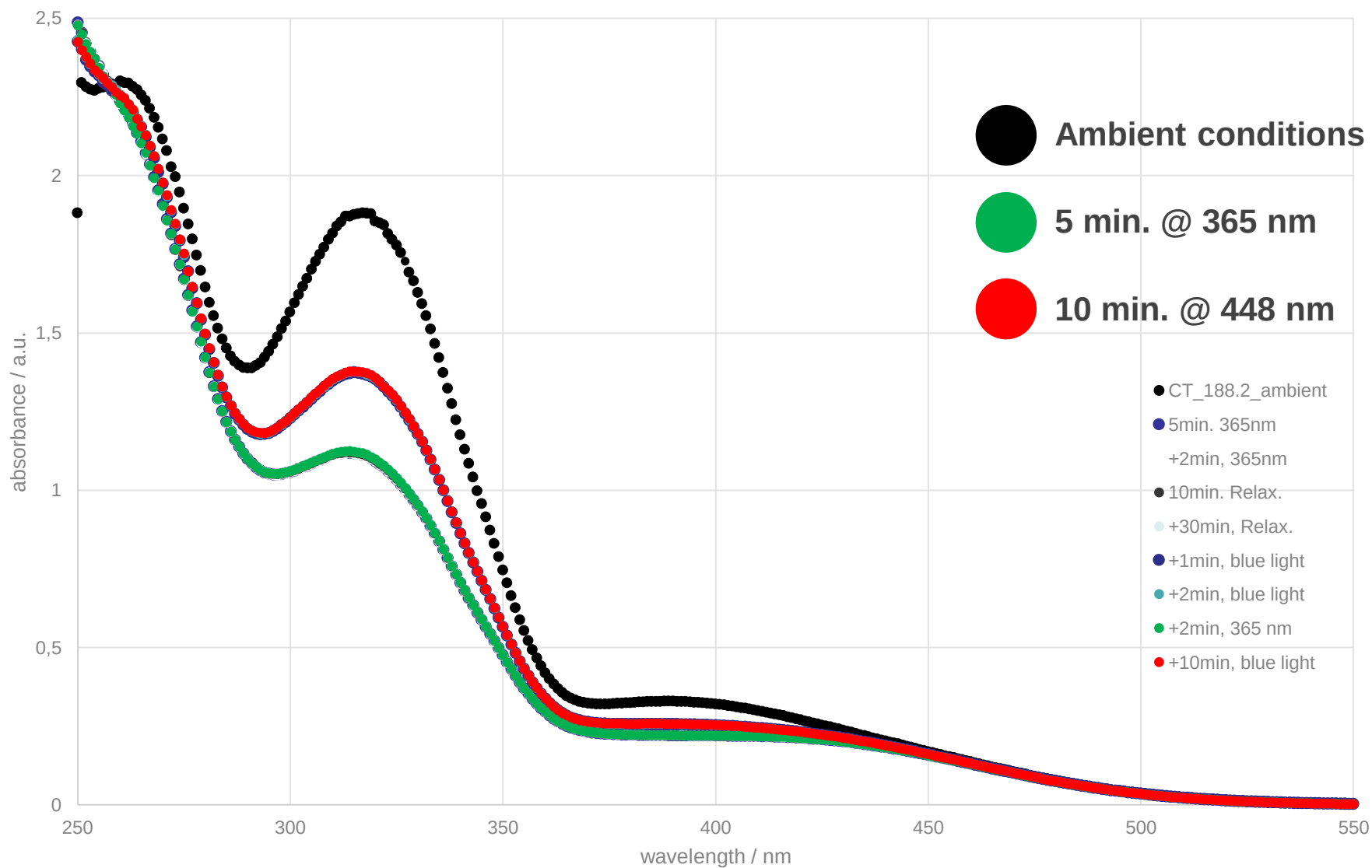
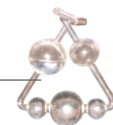
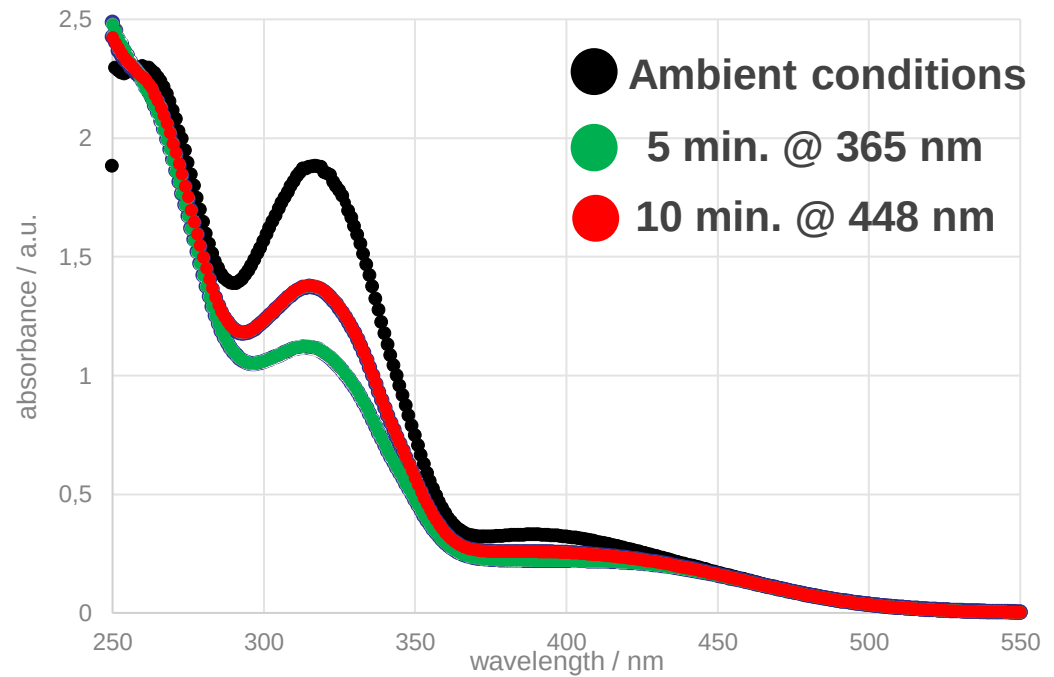
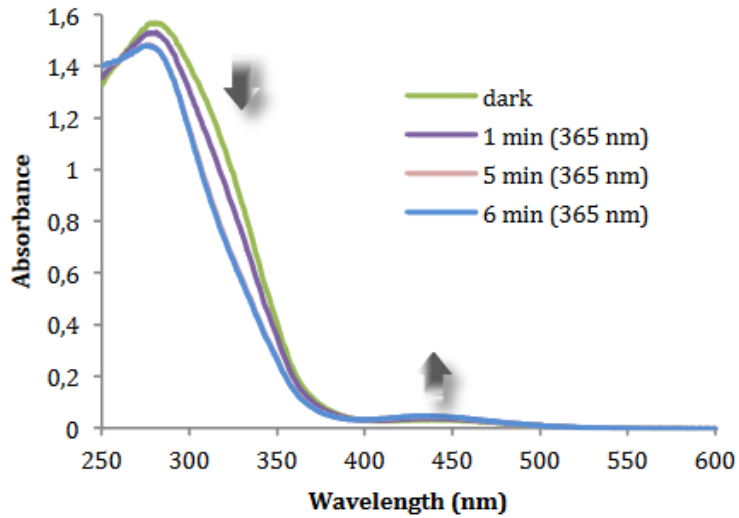


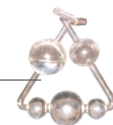
Figure S4. UV/Vis absorption spectra of catalyst V (25 μM in CH_2Cl_2) upon irradiation at 365 nm (left) and subsequent back isomerization upon exposure to 450 nm light (right).



Spectra recorded in CH_2Cl_2 , $c = 10^{-5} \text{ M}$

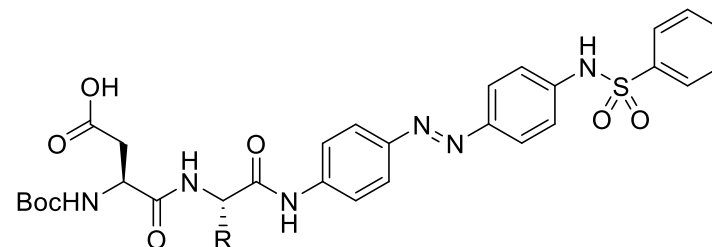
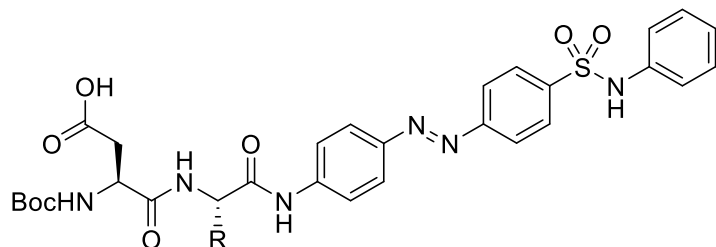


- obvious differences in UV-Vis absorption spectra
 - even different absorption maxima

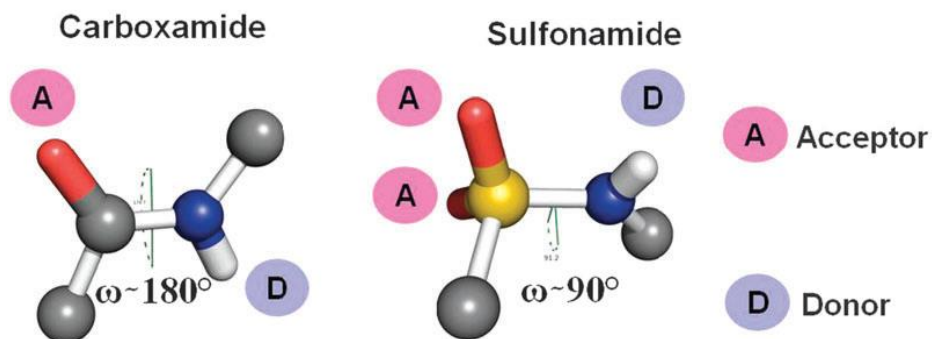


Alternative hydrogen bonding motifs instead thiourea where discussed in the following:

- Sulfonamide based catalysts?

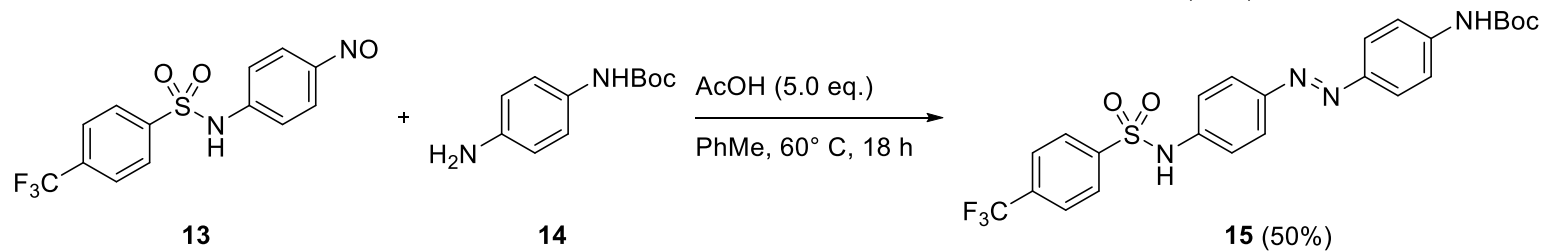
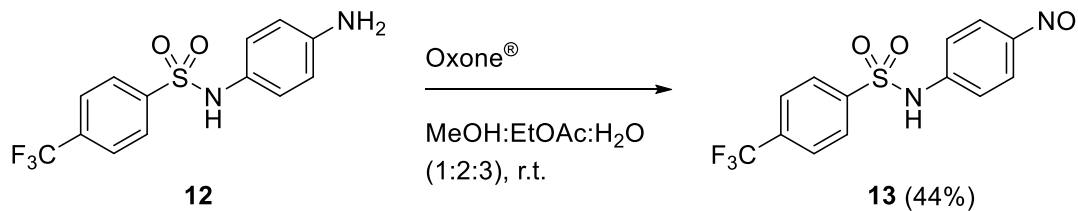
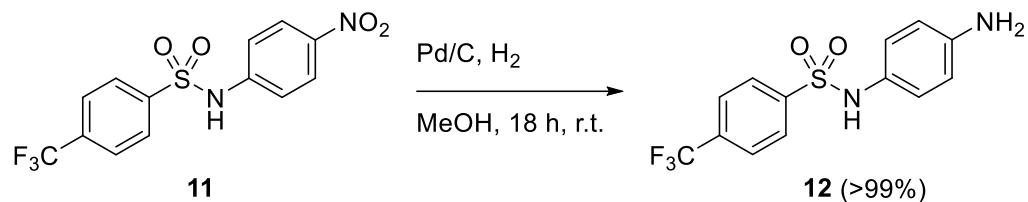
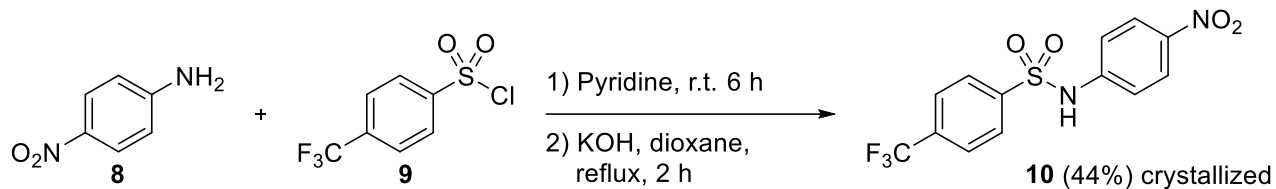


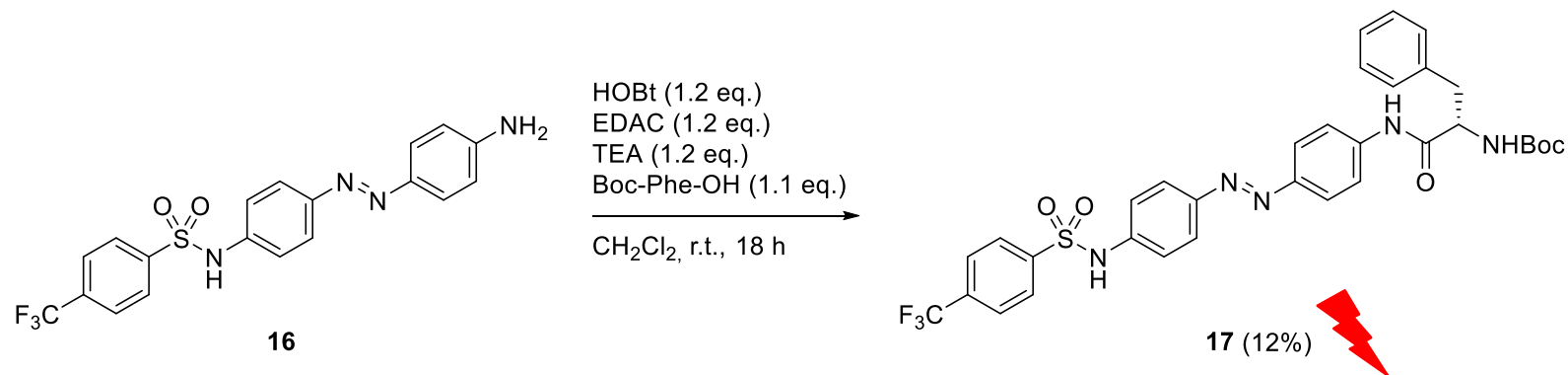
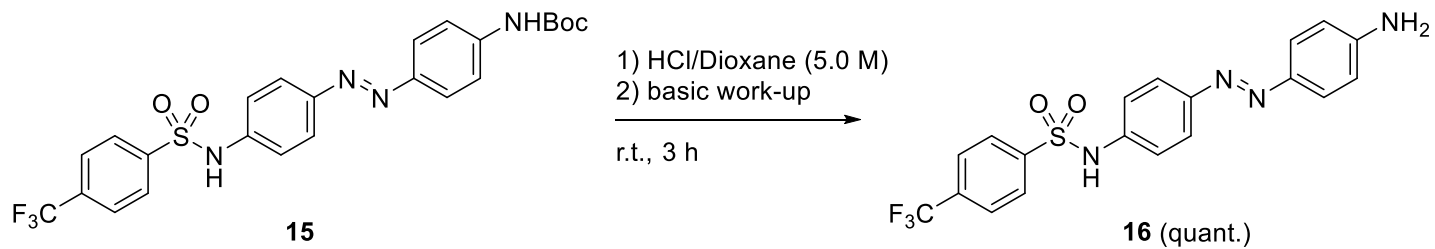
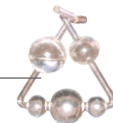
- Strong hydrogen bond donors, persistent to epoxidation reaction conditions.
- In contrast to thiourea, usually 90° twisted $\rightarrow$ overcome planarity and improve solubility?

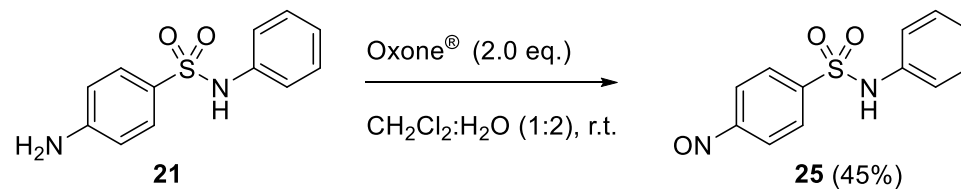
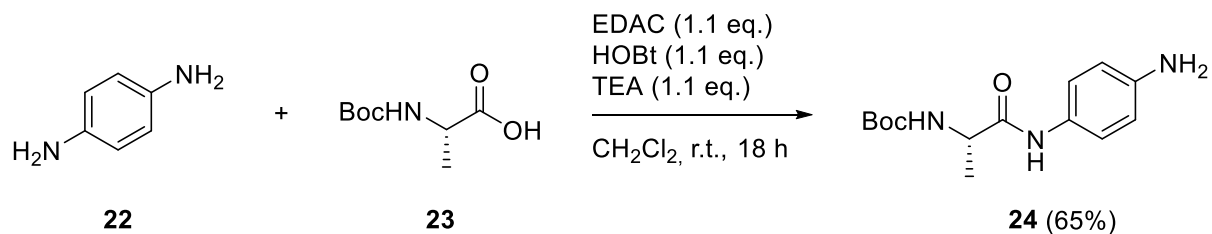
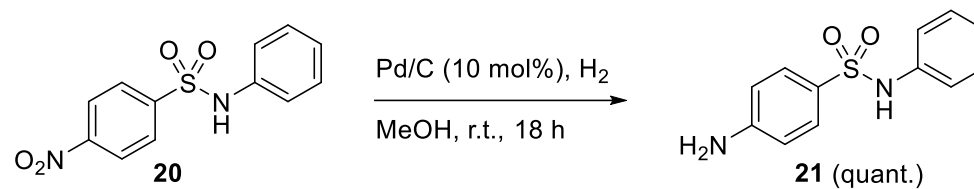
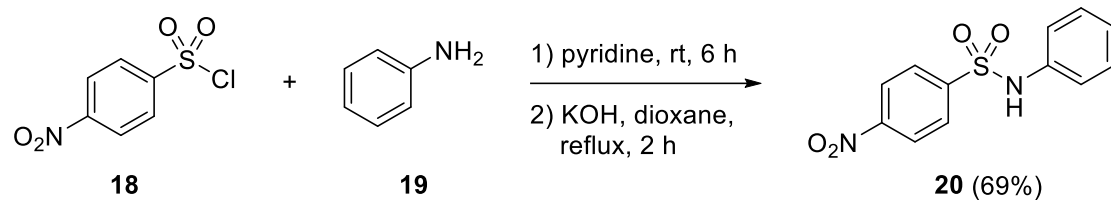
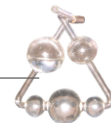


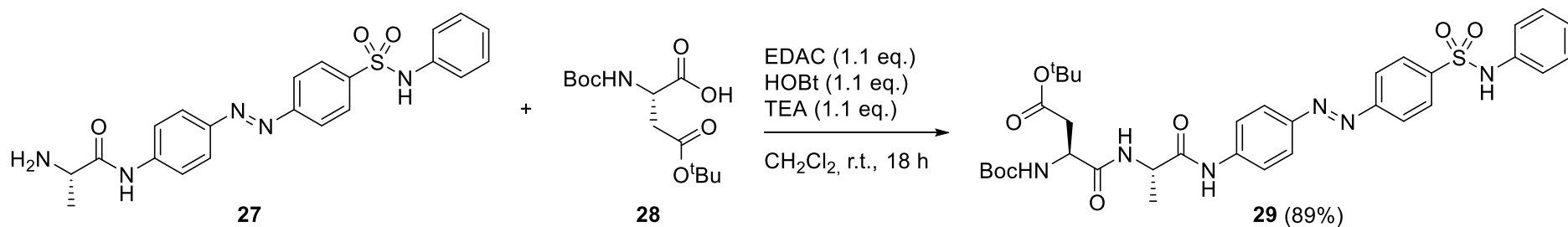
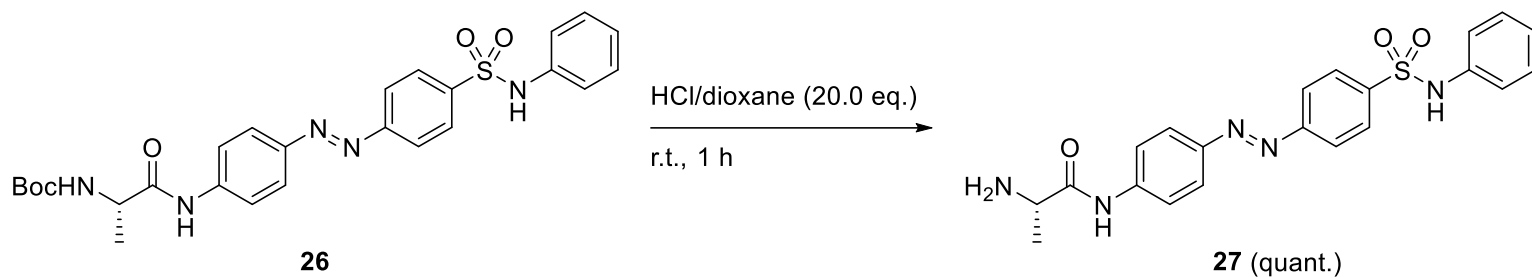
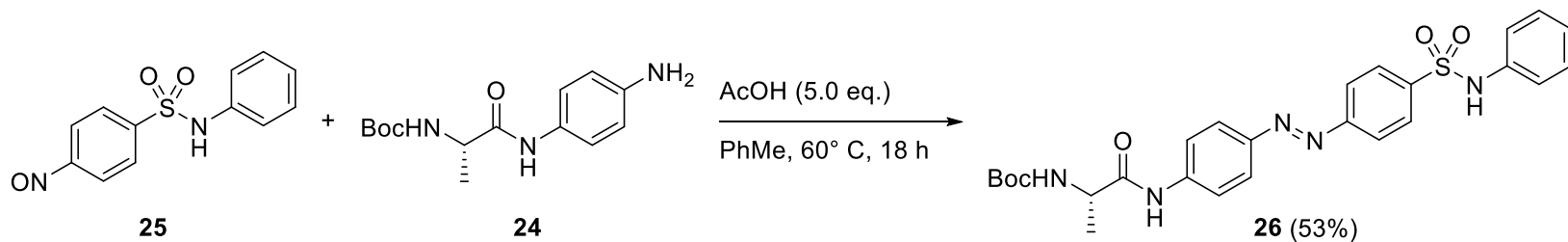
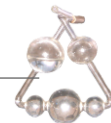


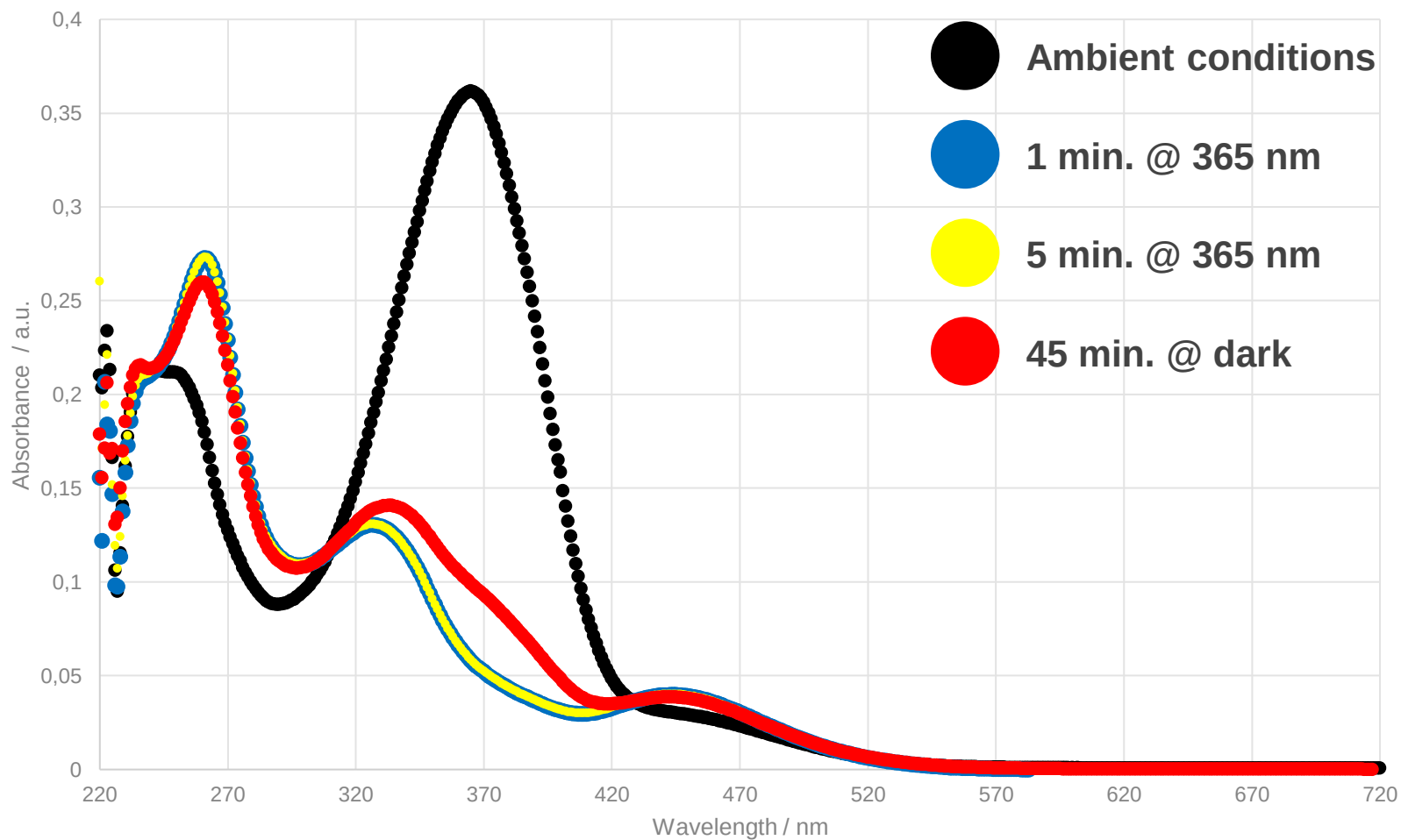
Starting with the materials we got in the lab.



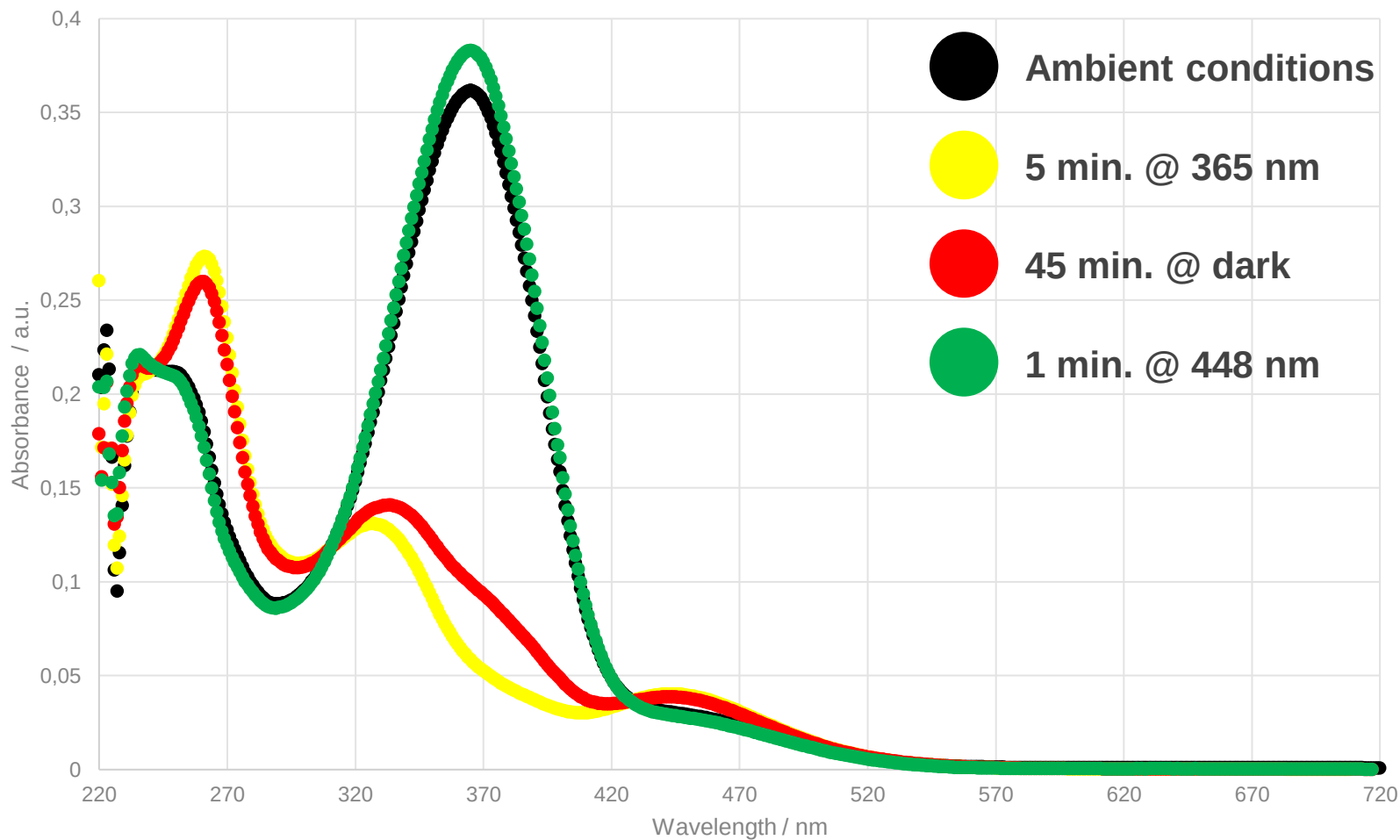




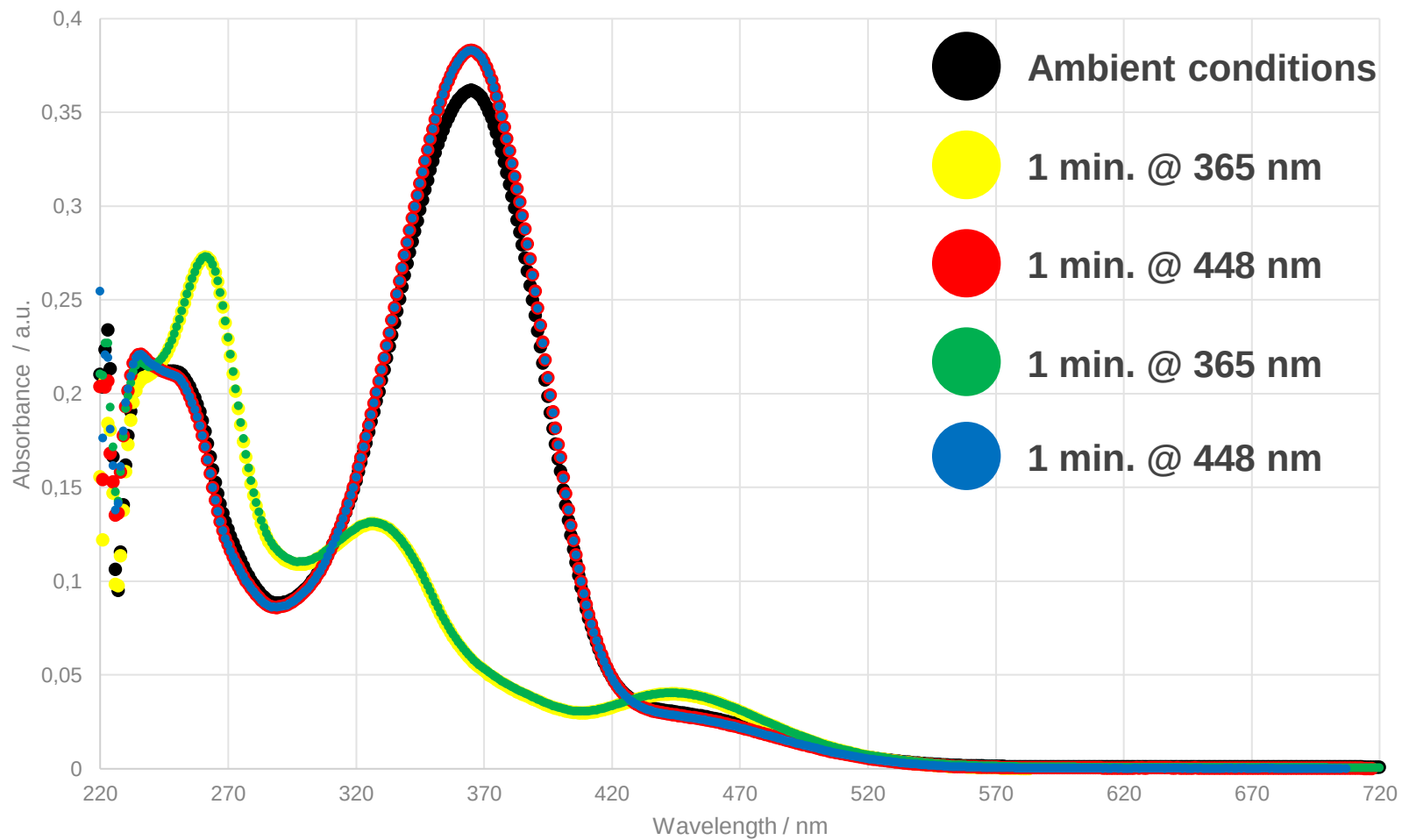




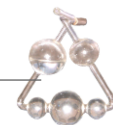
Spectra recorded in CH_2Cl_2 , $c = 10^{-5} \text{ M}$



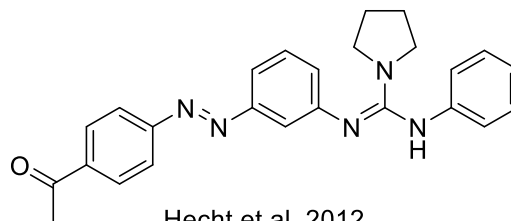
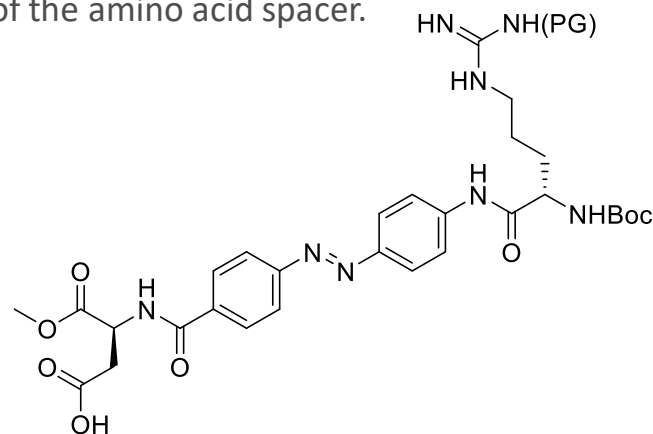
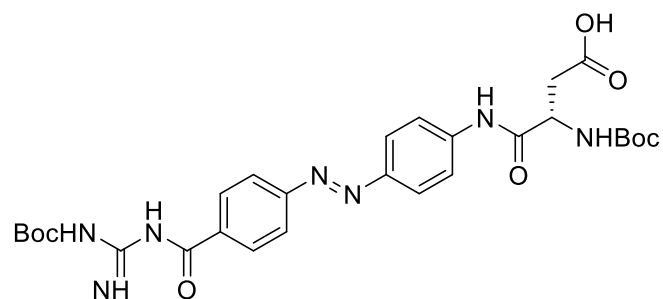
Spectra recorded in CH_2Cl_2 , $c = 10^{-5} \text{ M}$



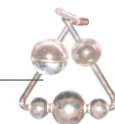
Spectra recorded in CH_2Cl_2 , $c = 10^{-5} \text{ M}$



- De- and reprotection of newly synthesized sulfonamide azobenzene.
 - Repeating UV-Vis spectroscopy and testing activity.
- Organizing another cooperation with the Thiele Group from TUD.
 - Validation of switching properties.
 - Ensuring that NMR-switching is generally possible to rebuild the setup with Mrs. Hausmann.
- Generating a catalyst library for screening by permutation of the amino acid spacer.
- Guanidin based catalysts?



Hecht et al. 2012

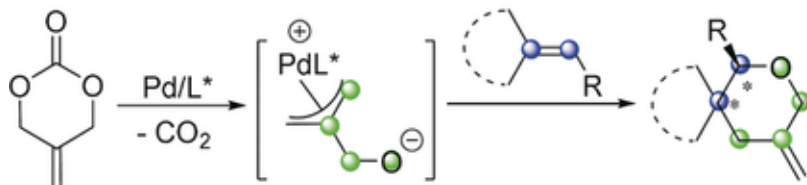


Asymmetric Catalysis

Palladium-Catalyzed Asymmetric [4+2] Cycloaddition of 2-Methylidenetrimethylene Carbonate with Alkenes: Access to Chiral Tetrahydropyran-Fused Spirocyclic Scaffolds

Biming Mao, Honglei Liu, Zhengyang Yan, Yi Xu, Jiaqing Xu, Wei Wang, Yongjun Wu, and Hongchao Guo*

b) this work: Pd-catalyzed asymmetric cycloadditions of 2-alkylidenetrimethylene carbonates with alkenes



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German Edition: doi.org/10.1002/ange.202002765

Organic & Biomolecular Chemistry



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Pd-Catalyzed asymmetric [5 + 2] cycloaddition of vinyl ethylene carbonates and cyclic imines: access to N-fused 1,3-oxazepines†

Hye-In Ahn,† Jong-Un Park,‡ Zi Xuan* and Ju Hyun Kim ‡*

Green Chemistry



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CRITICAL REVIEW

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Recent developments in organocatalysed transformations of epoxides and carbon dioxide into cyclic carbonates

Liping Guo, ‡*^{a,b} Katie J. Lamb ‡*^a and Michael North ‡^a

CRITICAL REVIEW

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Recent advances in the use of catalysts based on natural products for the conversion of CO₂ into cyclic carbonates

Carmen Claver, ‡^{a,b} Md Bin Yeamin,^a Mar Reguero ‡^a and Anna M. Masdeu-Bultó ‡^a

B. Mao, H. Liu, Z. Yan, Y. Xu, J. Xu, W. Wang, Y. Wu, H. Guo, *Angew. Chem. Int. Ed.* **2020**, 59, 11316–11320. H. I. Ahn, J. U. Park, Z. Xuan, J. H. Kim, *Org. Biomol. Chem.* **2020**, 18, 9826–9830. C. Claver, M. Bin Yeamin, M. Reguero, A. M. Masdeu-Bultó, *Green Chem.* **2020**, 22, 7665–7706. L. Guo, K. J. Lamb, M. North, *Green Chem.* **2021**, 23, 77–118.



- *Prof. Dr. Peter R. Schreiner*
- *Jan M. Metzler*
- *B204 & B205 & B201*
- *OC-Analytics*
- *PRS Group*



