

Molecular Conformation and Organic Photochemistry

Time-resolved Photoionization Studies

Bearbeitet von
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Preface

*Give a man a fish and he will eat for a day.
Teach a man to fish and he will eat for a lifetime.*
Chinese Proverb

This thesis has been submitted to the Faculty of Science, University of Copenhagen, as a partial fulfillment of the requirements to obtain the PhD degree. The work presented here was carried out at the Department of Chemistry in the years 2008–2011 under the joint supervision of Klaus B. Møller, Technical University of Denmark, and Theis I. Sølling, University of Copenhagen.

Acknowledgements

I have by now spent more than five years working in the field of ultrafast photochemical reaction dynamics. Thanks to a fruitful collaboration between my supervisors I have been fortunate to be able to make efforts and experiences in both theoretical and experimental directions. I am sincerely grateful to Theis and Klaus for their commitment and for giving me opportunities and support that I believe few PhD students will encounter.

During my PhD studies I was fortunate to have the opportunity to stay 11 months in the Molecular Photonics Group lead by Albert Stolow at the Steacie Institute for Molecular Sciences in Ottawa. I will always remember this as a scientific experience that compares to nothing. I am sincerely grateful to Albert for letting me join his lab and the rest of the group for being friendly and inspiring colleagues. Albert strongly encouraged me to acquire some hands-on laser experience, which resulted in a project of rebuilding a picosecond amplifier system. After many late and frustrating hours in the lab the project succeeded. For that I owe Rune Lausten a big thank for teaching me the “do’s and dont’s” of lasers and

nonlinear optics and for good times in the lab. Whereas the project did not result in any publications, it more importantly gave me experience that has proven invaluable for the rest of my lab work. Thanks to Michael Schuurman from the Theory group at Steacie I got the opportunity to perform quantum dynamics simulations while in Ottawa and I would like to thank Michael for patiently answering all my questions, benefiting little from it himself. Oliver Schalk and Andrey Boguslavskiy tirelessly worked with me in the basement at Steacie, even on late Fridays getting difficult experiments to work. I sincerely appreciate their commitment and had a lot of fun with Oliver and Andrey in the lab.

Special thanks go to Henning Hopf and his group at University of Braunschweig, Germany, for a fruitful collaboration involving the paracyclophanes. Their impressive synthetic skills were crucial for the success of our experiments.

As a PhD student you quickly realize that experiments rarely work the first time, and the experiments planned in collaboration with Søren Keiding, Aarhus University, was not an exception. Limited time excluded a second try during my project, but I am grateful to Søren and Jan Thøgersen for their hospitality, and I hope for the experiment and the collaboration to be successful. I thank Christer Bisgaard for kindly sharing his experiences and giving great advice on the experimental setup in Copenhagen. During many years Steen Hammerum has had a significant influence on my education at the Department of Chemistry. As few scientists possess the same lucidity as Steen, our fierce scientific discussions have without doubt made me a better chemist, which I am truly grateful for. A major thank to Anne Stephansen for volunteering to proofread the thesis.

Last, but certainly not least, I would like to thank Martin Rosenberg, Thomas Kuhlman and all of you from “Massekælderens” who over the years have contributed to a thriving scientific and social environment that I have enjoyed ever since I started as a bachelor student.

Collegium Domus Regiæ, October 26, 2011

Rasmus Y. Brogaard