Dick Stufkens Prijs 2015 awarded to chemist Tatu Kumpulainen

For innovative research into photo activated acids

The Dick Stufkens Prijs for the best PhD thesis of the Holland Research School of Molecular Chemistry (HRSMC) has this year been awarded to Dr. Tatu S. Kumpulainen for his thesis "Proton-Transfer Reactions in 'Super' Photoacids and Supramolecular Assemblies". It describes his innovative research into methods for photo activation of acid-base reactions. Kumpulainen will receive his prize at the annual HRSMC symposium in Amsterdam.

In his thesis Tatu Kumpulainen describes the design, synthesis and characterisation of a new generation of photo acids. He convincingly demonstrates their applicability in fields such as (photo)catalysis and photo driven molecular machines. In addition he reveals in great detail the mechanism and dynamics of the proton-transfer processes underlying their reactivity, both in aqueous media and in organic solvent mixtures.

Background on photo acids

The absorption of light can lead to dramatic changes in the properties of molecules. With photo acids during irradiation a dramatic increase in acidity is observed. This change usually is short-lived and fully reversible: after the light absorption the molecule reverts to its normal dark state, its so-called ground state.

The increase in the acidity of photo acids can be employed to induce acid-driven reactions triggered by pulsed flashes of light. These reactions occur in the well-defined region of the light spot and only during a short time window defined by the light pulse and the time it takes the photo acid to revert to its ground state.

Of course the use of these principles for the performance of space- and time-controlled chemical manipulations strongly depends on the availability of photo acids with suitable properties. By developing a new range of photo acids Tatu Kumpulainen has opened up a wealth of new possibilities.

Admirable

The jury of the Dick Stufkens Prijs is impressed by the quality, the originality and the interdisciplinary character of Tatu Kumpulainen's PhD thesis and expects that his work will have considerable impact in future development of photo induced processes. Studies like these require the combination of a wide array of chemical, spectroscopic and quantum chemical techniques, a combination Tatu mastered in an admirable fashion both individually as well as in fruitful collaborations with other groups.

Tatu performed his research at the Van 't Hoff Institute for Molecular Sciences of the University of Amsterdam. He defended his thesis on 21 May 2015 with promotor Prof. A.M. (Fred) Brouwer and co-promotor Prof. S. (Sander) Woutersen. After his thesis defence Tatu moved to Geneva where he is presently employed by the Vauthey Research Group at the University of Geneva as a postdoctoral researcher.

Best thesis

The Dick Stufkens Prijs is awarded annually to the best thesis of a Ph.D. student belonging to the Holland Research School of Molecular Chemistry (HRSMC). The prize – first awarded in 2008 - consists of a certificate and 1000 euro. Prof. J.W. (Jan) Verhoeven will present the 2015 prize to the winner on November 5 on behalf of the jury during the annual HRSMC symposium held at the VU University Amsterdam. At the symposium Tatu Kumpulainen will give a lecture on his PhD research, various

HRSMC PhD students and staff members will present lectures and posters, and Spinoza laureate Prof. B.M. (Bert) Weckhuysen will give an invited lecture.

The HRSMC symposium is open for non-HRSMC members. For further information consult http://www.hrsmc.nl/symposium2015/programme2015.html

About the HRSMC

The Holland Research School of Molecular Chemistry was founded in 1994 and has been accredited by the Dutch Royal Academy of Arts and Sciences (KNAW). The research school combines experimental and theoretical groups working on molecular chemistry and physics from the University of Amsterdam, the VU University Amsterdam and Leiden University. Apart from creating the appropriate conditions for further collaboration between the participating groups, the school also provides an internationally highly acclaimed teaching program for PhD students. Prof. Dick Stufkens [†], scientific director during the 1997-2001 period, has been one of the driving forces behind the HRSMC. His efforts have, amongst others, contributed significantly to the international reputation of the HRSMC.