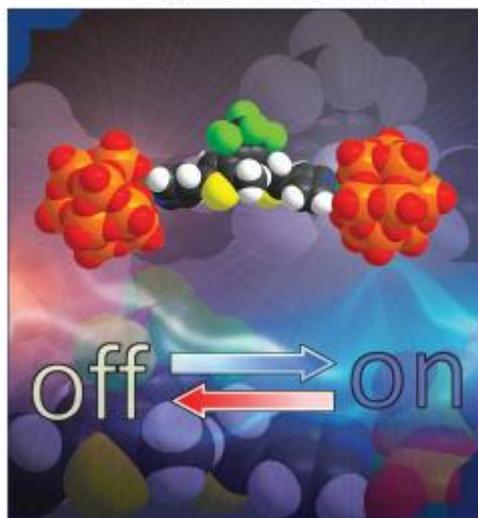


We recently discovered that Polyoxometalates (POMs) can be used as sensitizers to trigger the photochemical transformation of diarylethene (DAE) photochromes using visible light, a process that would otherwise require irradiation with higher energy UV. Lowering of the energy barrier for the photochemical reaction results from coordination of the photochrome to the POM, with excitation of POM based electronic transitions promoting the photochemical reaction. This process results in the ultrafast conversion (picoseconds) of the assembly to a more highly conjugated species that results in a dramatic colour change from pale yellow to deep blue. The photoinduced cyclization can be reversed by irradiation of the sample with red light.

Extension of this project will involve the synthesis of polyoxometalates with appropriate binding sites for attachment of diarylethene ligands using a range of chemical approaches. The resulting compounds will be structurally characterized with an emphasis on understanding how the POMs impact the steric and electronic properties of the attached DAEs. The photophysical properties of these molecules will be investigated within our international collaborative network.

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To achieve these project goals, we are seeking two excellent Ph.D. candidates with a passion for synthetic chemistry and a curiosity to discover new molecular materials with potential application in emerging photochromic technologies. The candidate will receive all the required training to conduct the research but must have a strong desire to assume ownership of the project and work independently.

Supervisor: Dr Chris Ritchie (chris.ritchie@monash.edu)

Faculty / Portfolio: School of Chemistry, Faculty of Science, Clayton Campus, Monash University

Candidate Requirements:

Applicants will be considered if they fulfil the criteria for Ph.D. admission at Monash University and demonstrate excellent research capability. Details of the relevant requirements are available at <http://www.monash.edu/graduateresearch/future-students/eligibility2/eligibility/>

Interested candidates that meet the candidate requirements detailed in the previous link **MUST** then submit an Expression of Interest (EOI) <http://www.monash.edu/science/schools/chemistry/postgraduate/express-interest> **AND** email me the following.

A cover letter that includes a brief statement of the applicant's suitability

A curriculum vitae, including a list of any published works

A full statement of academic record, supported by scanned copies of relevant certified documentation (including transcripts)

Contact details of two academic referees and/or reference letters

Evidence of English-language proficiency (international applicants only) such as TOEFL or IELTS.

Relevant Project References

"Visible-Light-Driven "On"/"Off" Photochromism of a Polyoxometalate Diarylethene Coordination Complex", Jingjing Xu, Henrieta Volfova, Roger J. Mulder, Lars Goerigk, Gary Bryant, Eberhard Riedle, and Chris Ritchie*. *Journal of the American Chemical Society*, **2018**, 140 (33), 10482-10487, DOI: 10.1021/jacs.8b04900