

Professor John C. Walton

Research Professor of Chemistry

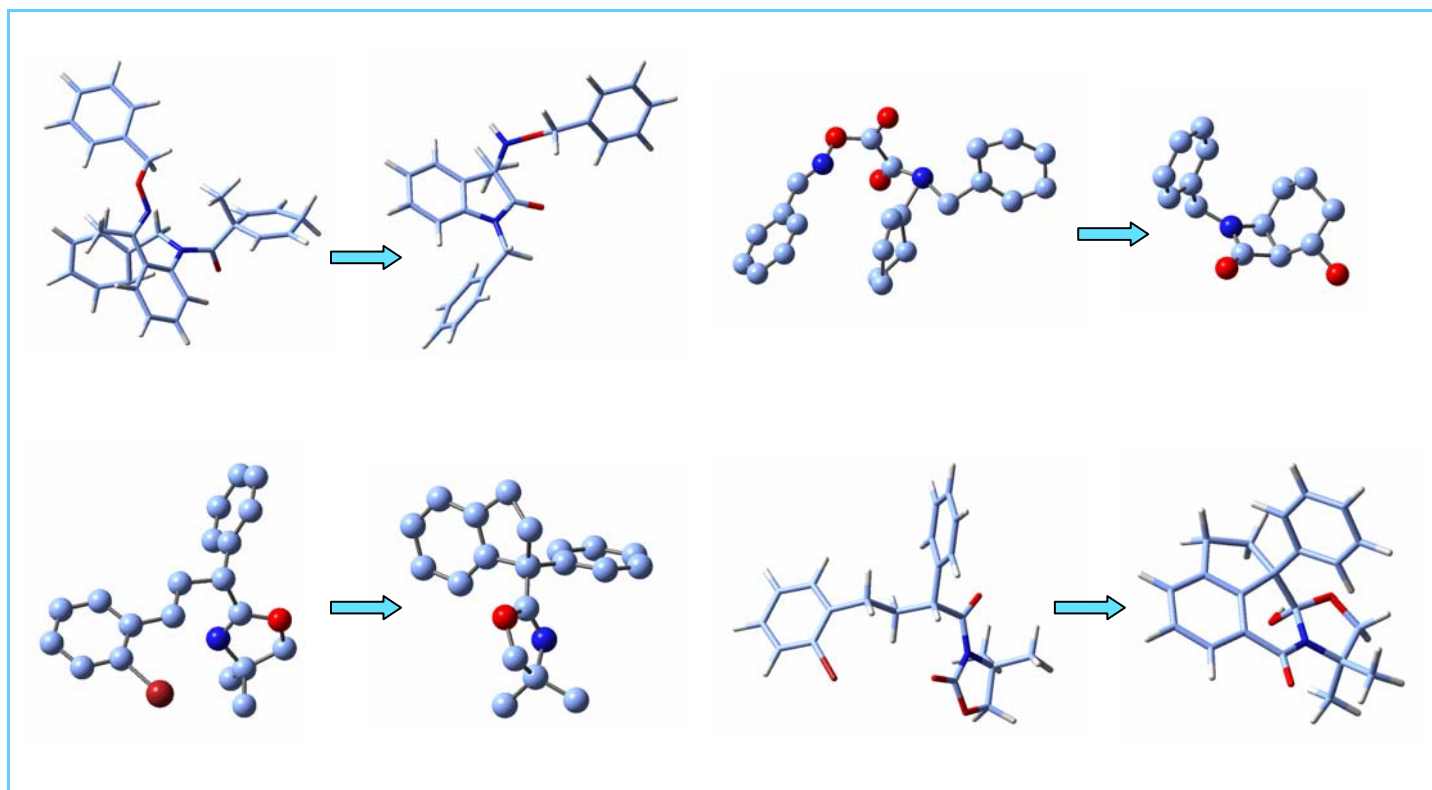
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Research Interests: Organic synthetic methods, free-radical chemistry, photocatalysis, EPR spectroscopy

Group research focuses on the design of new and improved reactions that can be used to make novel molecules, materials and medicines. Current emphasis is on transformations of reactive intermediates, particularly free radicals. Several useful types of reagents that release these species have been produced and tested. Cyclohexadiene-based reagents release radicals that are transformed into derivatives of cycloalkanes, indolones and β - and γ -lactams.



Oxime oxalate amides release carbamoyl radicals that can be used to prepare β -lactam rings. Bromoaryl alkyl linked oxazolines provide radical-ions that take part in cyclo-coupling reactions to provide a range of heterocyclic structures. Photocatalysts are being employed in clean synthetic methodology. The reactants, products and intermediates are studied by EPR spectroscopic and computational methods to help in the formulation of explanatory theoretical tools.

SELECTED RECENT PUBLICATIONS

1. EPR Studies of the Generation, Structure and Reactivity of N-Heterocyclic Carbene Borane Radicals. J. C. Walton, M. M. Brahmī, L. Fensterbank, E. Lacôte, Max Malacria, Q. Chu, S.-H. Ueng, A. Solov'ev and D. P. Curran, *J. Am. Chem. Soc.* 2010 **132**, 2350-2358.
2. 5-Exo-Cyclizations of Pentenyliminyl Radicals: Inversion of the gem-Dimethyl Effect. F. Portela-Cubillo, R. Alonso-Ruiz, D. Sampedro and J. C. Walton, *J. Phys. Chem. A* 2009, **113**, 10005–10012.
3. Microwave-promoted Syntheses of Quinazolines and Dihydroquinazolines from 2-Aminoarylalkanone O-Phenyl Oximes. Fernando Portela-Cubillo, Jackie S. Scott, and John C. Walton. *J. Org. Chem.* 2009, **74**, 4934-4942.
4. From dioxime oxalates to dihydropyrroles and phenanthridines via iminyl radicals. F. Portela-Cubillo, E. M. Scanlan, J. S. Scott and J. C. Walton, *Chem. Commun.* 2008, 4189-4191.
5. Evolution of functional cyclohexadiene-based synthetic reagents: the importance of becoming aromatic. J. C. Walton and A. Studer. *Acc. Chem. Res.* 2005. **38**. 794-802.