Professor Hamish McNab
Personal Chair in Heterocyclic Chemistry

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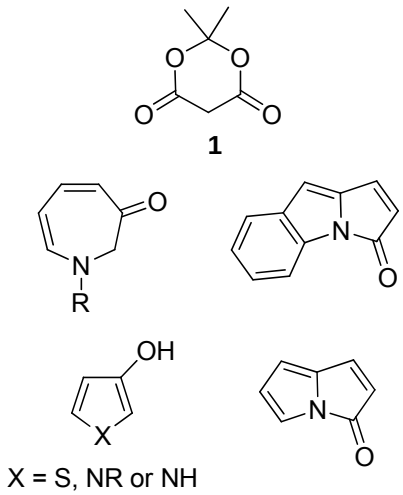
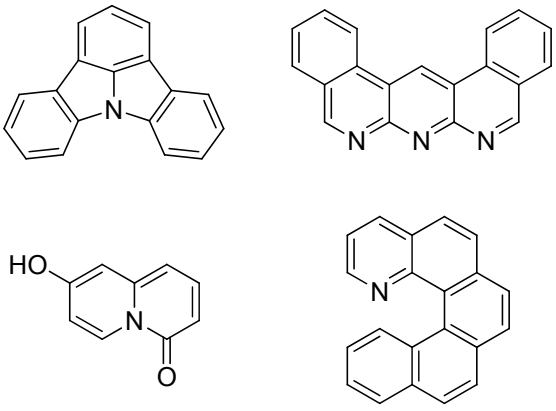
Research Interests: Heterocyclic chemistry, flash vacuum pyrolysis (FVP), reactive intermediates, dyestuffs and other novel π-systems.

The core synthetic work of the group is concerned with discovery, mechanistic elucidation and development of new synthetic methods in heterocyclic chemistry employing the technique of flash vacuum pyrolysis (FVP) (see apparatus below). Most of these reactions are either pericyclic in nature (often involving ketene intermediates generated from derivatives of Meldrum's acid **1**), or take place *via* free radicals. Some examples of ring systems we have studied are shown below; many are strained or have other destabilizing features. Recent collaborative projects in heterocyclic chemistry include the synthesis of contiguous hydrogen bond acceptor systems (with Professor D. A. Leigh) and the formation of electrically conducting oligomeric thin films (with Dr. A. R. Mount).

The effect of heterogeneous catalysts on FVP processes (*e.g.* dehydration, dehydrogenation and cyclisation reactions) is being investigated.

A collaborative study of natural textile dyes [with Dr. A. N. Hulme and Dr. J. Tate (National Museums of Scotland)] explores application of the chemistry of conjugated systems from an historical perspective and is supported by the EPSRC/AHRC Science and Heritage Programme. The identification of dyes used in 16th century English tapestries and those employed in 19th century North American quillwork are of current interest. Studies of modern dyestuffs are supported by industry.





Current work is supported by EPSRC and by the specialty chemicals industry, and over 250 research papers have been published. Hamish McNab was awarded the 2003 Bader Prize of the Royal Society of Chemistry 'for many distinguished contributions to flash vacuum pyrolysis, to the chemistry of Meldrum's acid and to heterocyclic chemistry'.

SELECTED RECENT PUBLICATIONS

1. The Meldrum's Acid Route to Prodigiosin Analogues. G. A. Hunter, H. McNab and K. Withell, *Synthesis*, 2010, 1707-1711.
2. AAA-DDD Triple Hydrogen Bond Complexes. B. Blight, A. Camara-Campos, S. Djurdjevic, M. Kaller, D. A. Leigh, F. M. McMillan, H. McNab and A. Slawin, *J. Am. Chem. Soc.*, 2009, **131**, 14116-14122.
3. 3-Hydroxypyrrole. L. Hill, S. H. Imam, H. McNab and W. J. O'Neill, *Synthesis*, 2009, 2535-2538.
4. 1-Methoxycarbonylpyrrolizin-3-one and related compounds. X. L. M. Despinoy and H. McNab, *Org. Biomol. Chem.*, 2009, **7**, 2187-2194.
5. Synthesis and chemistry of 4,5-dihydrothieno[3,2-*b*]pyrrol-6-one – a heteroindoxyl. A. P. Gaywood and H. McNab, *J. Org. Chem*., 2009, **74**, 4278-4282.
6. The production and characterisation of novel conducting luminescent oligomeric thin films from electrooxidised indolo[3,2,1-*jk*]carbazole. S. I. Wharton, J. B. Henry, H. McNab and A. R. Mount, *Chem. Eur. J*., 2009, **15**, 5482-5490.