

A 50 Year Infatuation/Obsession with 1,3-Dipoles

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Part 1 of this presentation will provide a tribute to Professor Alan Katritzky's remarkable career in heterocyclic chemistry. In part 2, the chemistry of metal carbene complexes as a method to generate 1,3-dipoles is discussed. This approach bestows chemists with an exceptionally fertile ground for designing and developing new stereoselective bond construction for application toward the synthesis of various alkaloids. Due to their lability, metal carbene complexes are usually generated *in situ* from their corresponding diazo precursors prior to use. The reaction of α -diazo carbonyl compounds with transition metals such as rhodium(II) carboxylates constitutes a particularly powerful method for generating synthetically useful electrophilic carbene complexes. Earlier work by our group has shown that the rhodium(II) catalyzed reaction of α -diazo-3-oxobutanoates bearing tethered β -bonds represents a synthetically useful protocol for the construction of a variety of novel polycyclic skeletons. The Rh(II)-catalyzed reactions of the related 2-diazo-2-(1*H*-indol-2-yl)acetate system has now been examined as a potential route toward scandine, a member of the melodinus family of alkaloids. Attack of the neighboring carbonyl oxygen atom onto the rhodium carbenoid center produces a cyclic 1,3-dipole that undergoes cycloaddition with a tethered alkenyl group. The resulting cycloadduct corresponds to a potential intermediate in a planned synthesis of scandine.