

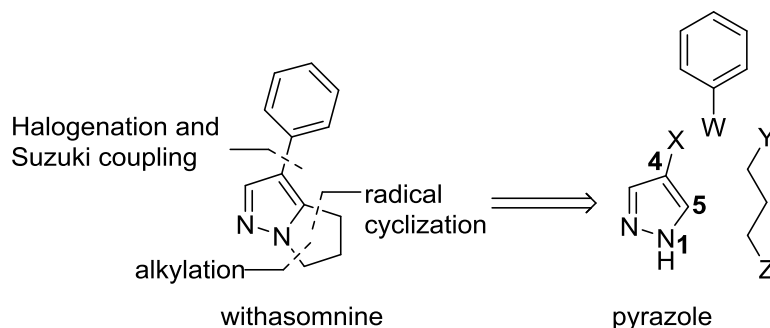
Total Synthesis of the Natural Product Withasomnine from Pyrazole

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Abstract

Withasomnine is a compound isolated from the plant *withania somnifera* and is often used in traditional Ayurvedic medicine. It is one of the few known natural products that contains a pyrazole heterocycle. Given our recent discovery of a halogenation reaction of pyrazoles that uses sodium halide salts in conjunction with Oxone®, this project aims to use our method in a total synthesis of withasomnine.



The synthetic strategy is to build withasomnine from pyrazole by a series of concise steps that will couple a phenyl ring to the 4-position, and form a fused ring system connected to the 1- and 5-positions of the ring. The phenyl ring will be halogenated by using the halogenation reaction described above. A Suzuki coupling with phenylboronic acid will install the requisite phenyl group. The fused ring system will be formed using an alkylation reaction to attach to the 1-position, followed by the formation of a xanthate ester that will serve as a precursor to a radical reaction that should complete the cyclization onto the 5-position of the ring, thereby completing the synthesis.