

## **Eight Membered Rings with Two Heteroatoms: Chemistry and Ring Synthesis**

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This course will deal with diheterocines, eight-membered rings with two N-, O-, or S-atoms or combination of these heteroatoms in 1,2-, 1,3-, 1,4-, and 1,5-relationship.

The six parent unsaturated systems are diazocine, oxazocine, thiazocine, dioxocin, oxathiocin, and dithiocin. Hydrogenated analogues are generally named as di-, tetra-, hexa-, or, in the case of diazocines, octa- or perhydro-derivatives. The completely saturated derivatives are referred to as diazocane, oxazocane, thiazocane, dioxocane, oxathiocane, and dithiocane in the literature. In addition to uncondensed derivatives, diheterocines fused to five-, six-, and seven-membered carbocycles or heterocycles will be covered, although in one case a four-membered fused ring will be occasionally reported. Bridged diheterocines, which actually constitute the majority of the compounds reported, will be covered as well.

The first part of the course will concern the ring syntheses from acyclic compounds classified by number of ring atoms contributed by each component and ring syntheses by transformation of another ring.

Whenever present natural products and related sources will be mentioned.

The second part of the course will deal with the reactivity of the rings, mainly describing thermal, photoinduced, acid, basic, oxidative, and reductive cleavages, with particular attention to biological active diheterocines. Then will be treated the large variety of reactions of substituents attached to ring carbon atoms followed by the relatively smaller variety of reactions of substituents attached to ring heteroatoms.