

Ashton Szarnicki

Roche Award

Chemistry Major

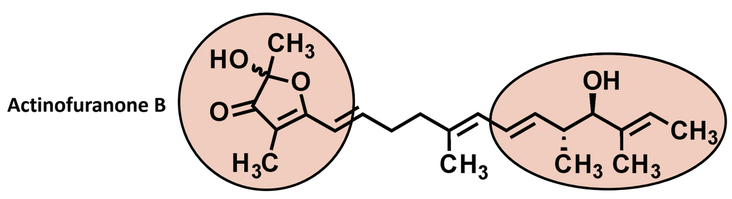
Second Year ARCS Scholar

MOREHOUSE COLLEGE

Investigating Solvent Effects on the Thermolysis of Ester Hydrazones: A Potential Route to Functionalized Carbenoids

Organocarbenes and carbenoids have recently emerged as useful intermediates in the synthesis of complex molecules, including many pharmaceutically important synthetic intermediates. As part of our research group's effort to improve both the safety and efficacy of carbene/carbenoid preparation for the undergraduate laboratory, this research project aims to determine the viability of ester hydrazones as precursors to functionalized carbenoids. Specifically, this project will investigate the role that solvent and temperature play in both the rate and yield of this decomposition in relation to both (a) the cyclopropanation of trans-stilbene and (B) functionalization of fluorene via C-H insertion.

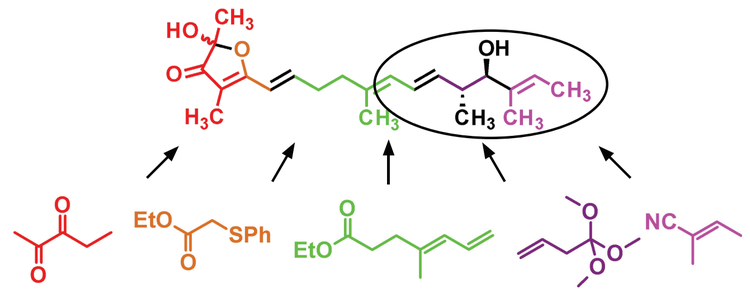
Actinofuranones: Natural Products from CNQ766, a Marine-Derived Streptomycete



- Bioactive structural motifs are conserved in a broad panel of secondary metabolites found many varieties of actinomycetes (and subspecies therein)

MOREHOUSE COLLEGE

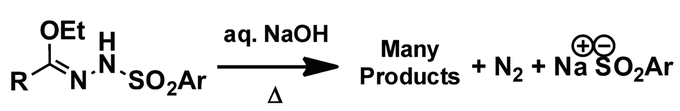
Target-Directed Strategy To Actinofuranones



Modular building block approach to Actinofuranone carbon framework allows for greater molecular diversity.

MOREHOUSE COLLEGE

Base-promoted Decomposition of Ester Hydrazones (EHs)

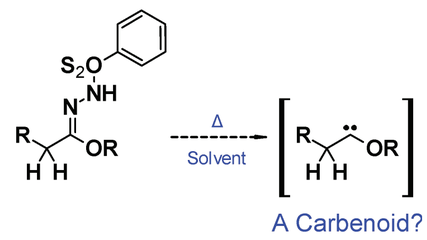


McDonald, R. M.; Krueger, R. A. *J. Org. Chem.* **1966**, 31(2), 488

In a similar way, ester hydrazones are decomposed at high T (>200 °C) in the presence of aqueous alkali to afford stoichiometric amounts of dinitrogen and sulfinic acid, suggesting a similar pathway for reactivity.

MOREHOUSE COLLEGE

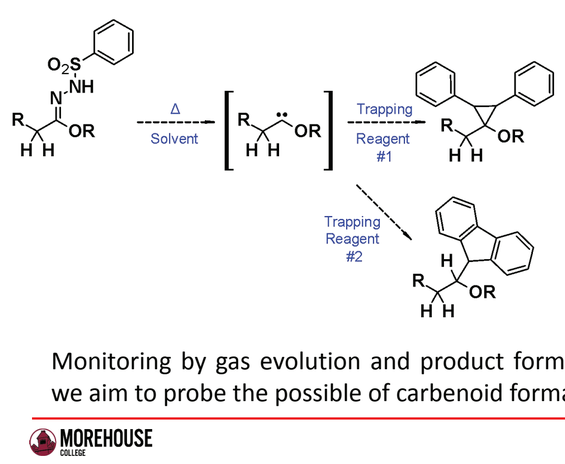
Thermolysis of Ester Hydrazones (EHs): Towards Functionalized Carbenoids?



An investigation of the heat-promoted decomposition of ester hydrazones might serve as a viable route to functionalized carbenoids.

MOREHOUSE COLLEGE

Project Goal: An Exploration of Solvent Effects



Solvents (planned for study)

cyclohexane
toluene
xylene
chlorobenzene
dimethoxyethane

Trapping Reagents (planned for study)

trans-stilbene (#1)
fluorene (#2)

Monitoring by gas evolution and product formation (GC/MS), we aim to probe the possible of carbenoid formation from EHs.

MOREHOUSE COLLEGE

SCHOLAR AWARDS CELEBRATION

250 Years of American Science: Honoring Those Who Advance It

ARCS ADVANCING SCIENCE IN AMERICA®