Department of Chemistry

COLLEGE OF SCIENCE | THE UNIVERSITY OF UTAH

Reagent of the Month
Diazomethane

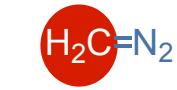
Buthaina Al Rifaie

Sigman Group

May 29th, 2019

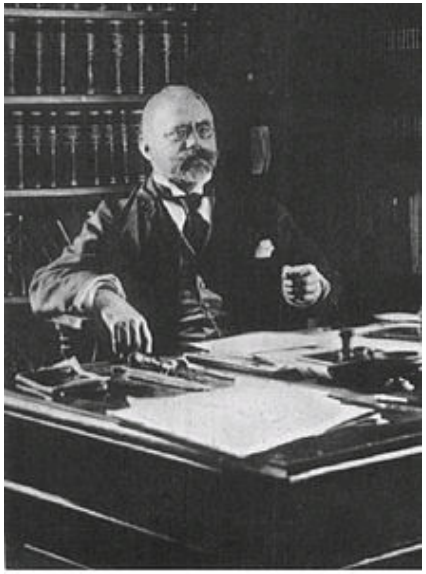
Introduction

explosive yellow gas
used a solution in diethyl ether



diazomethane

methylating agent
simplest diazo compound

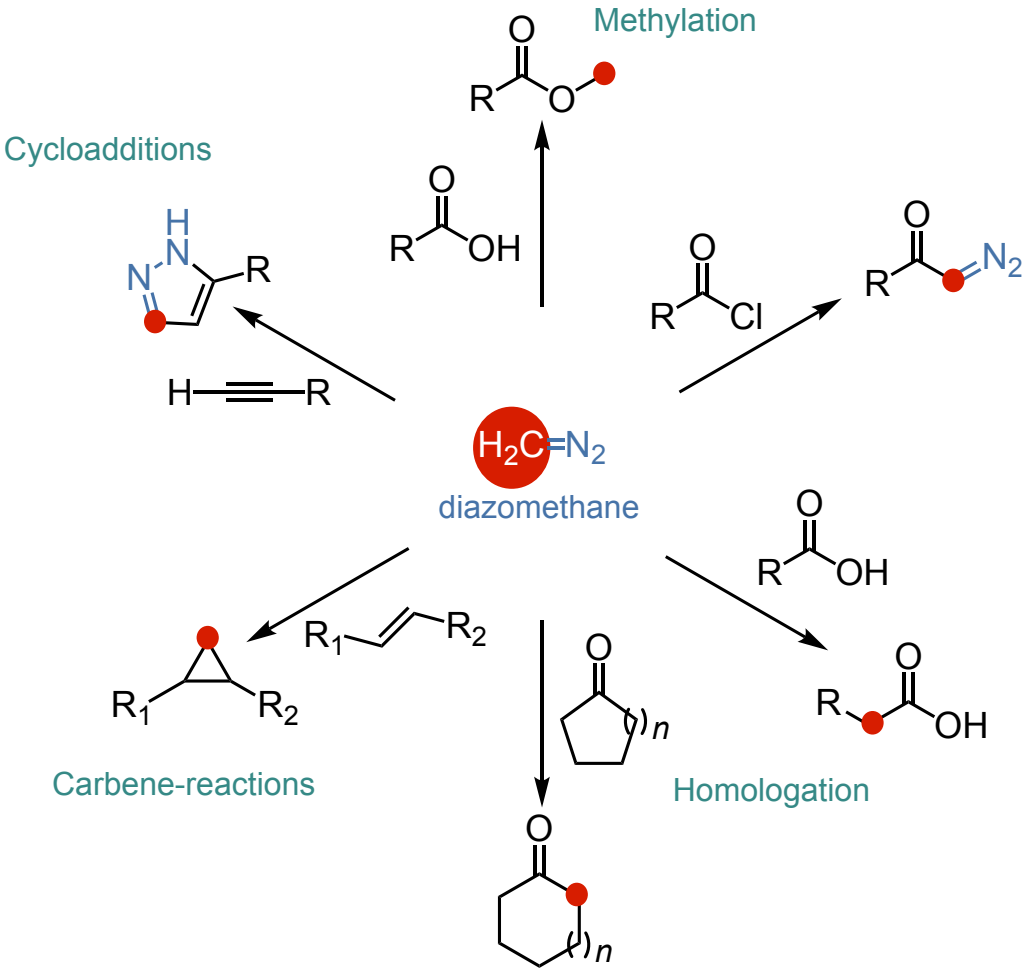


H. v. Pechmann

discovered in 1894 by
Hans von Pechmann (1850-1902)

Morandi, B.; Carreira, E. M. *Science* **2012**, *335*, 1471.

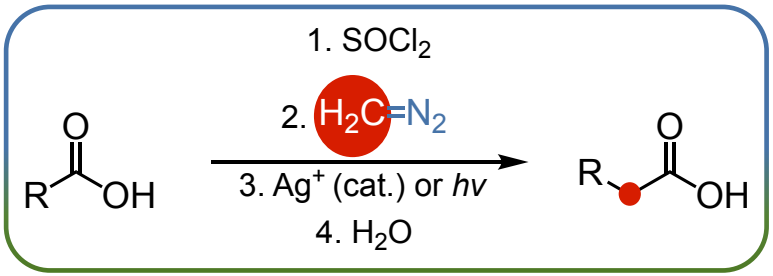
Utility



Dallinger, D.; Kappe, C. O. *Nat. Protoc.* **2017**, *12*, 2138.
Candeias, N. R.; Paterna, R.; Gois, P. M. P. *Chem. Rev*. **2016**, *116*, 2937-2981.

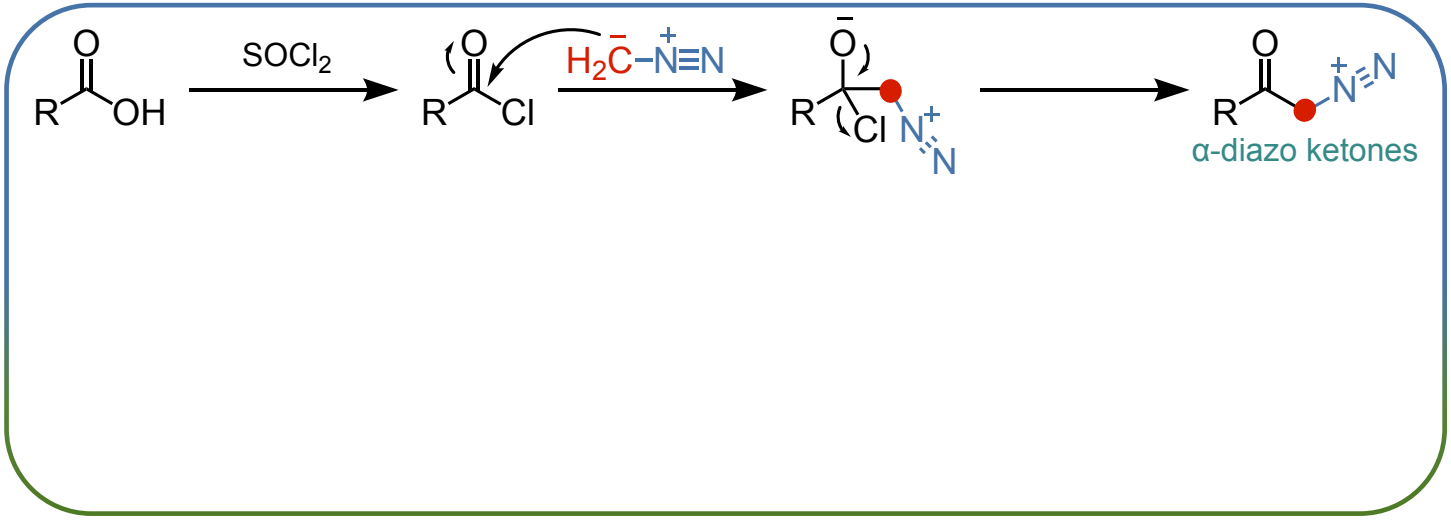
Reactivity

Arndt-Eistert Reaction



Fritz Arndt
(1885-1969)

Bernd Eistert
(1902-1978)



Arndt, F.; Eistert, B. *Ber. Dtsch. Chem, Ges*. **1935**, *68*, 200-208.
Wolff, L.; Krüche, R. *Justus Liebigs Ann. Chem*. **1912**, *394*, 23-59.

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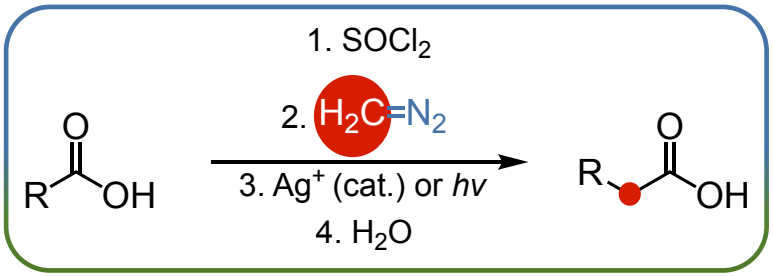

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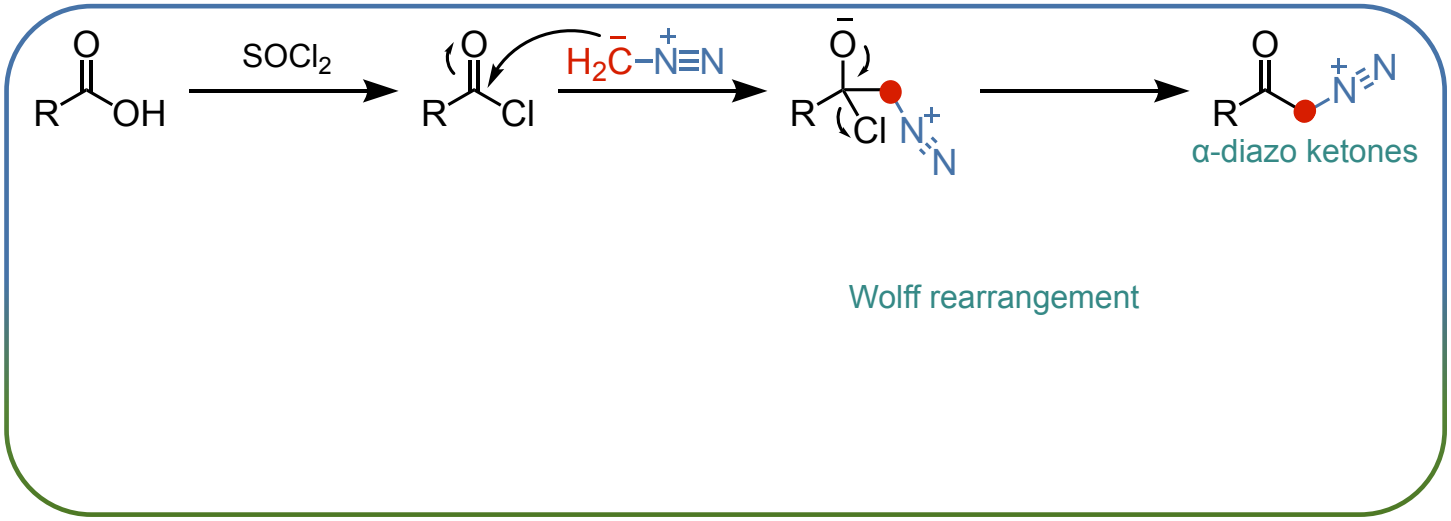

Ludwig Wolff
(1893-1968)

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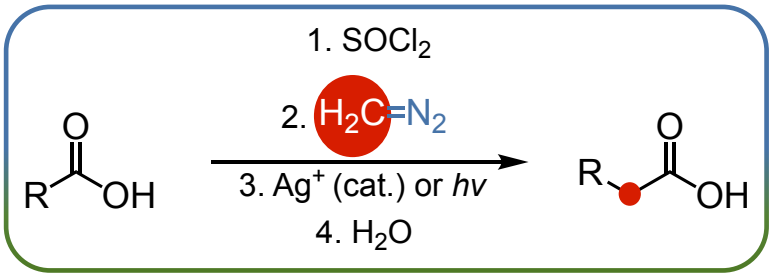

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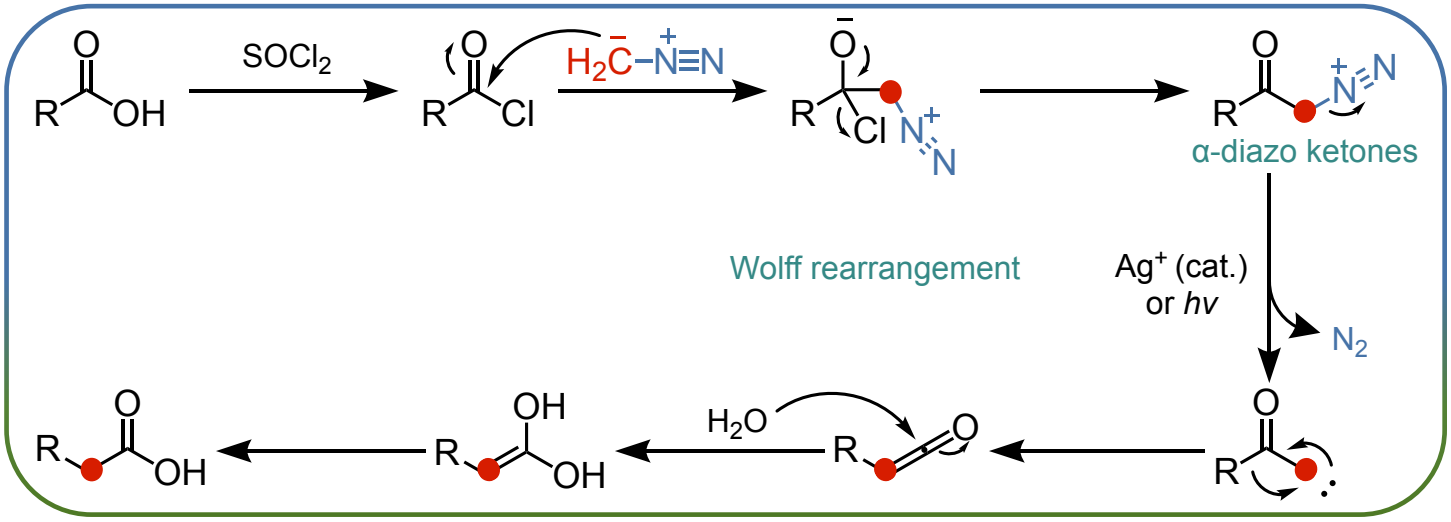

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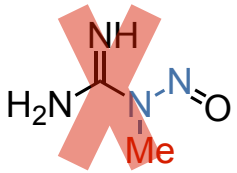
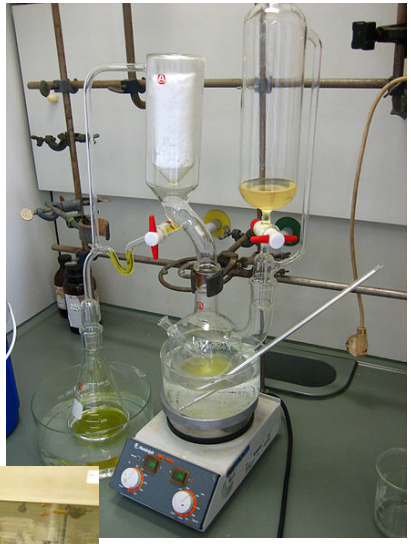
Preparation

N-methyl-N-nitroso precursor



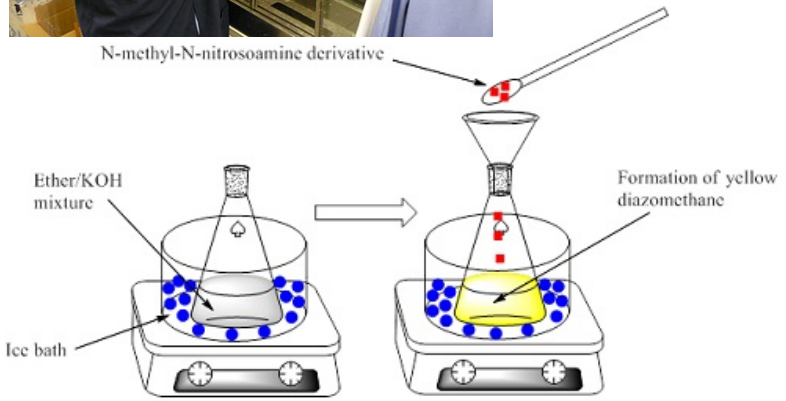
NMU

explosive
highly carcinogenic



strong aq.
base
diethyl ether

$H_2C{=}N_2$
diazomethane



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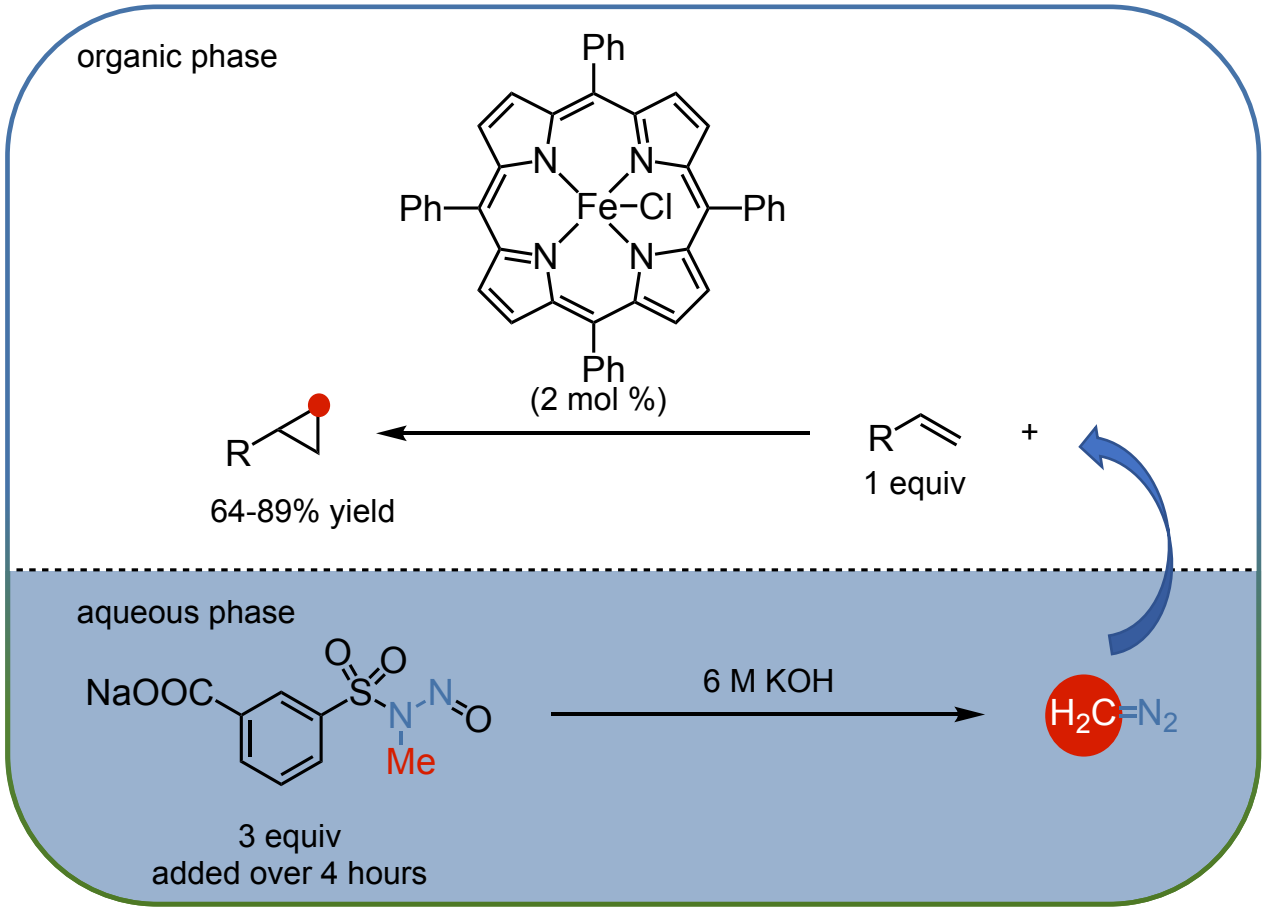
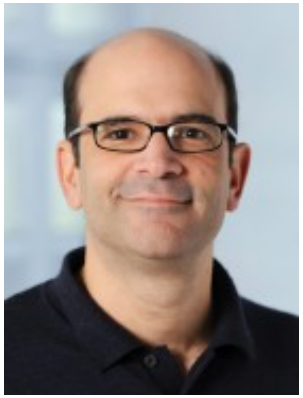
Picture credit: The university of Illinois

Preparation





Erick Carreira
ETH Zürich

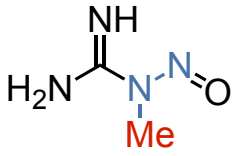
safe and controlled generation of diazomethane reagent

finding a compatible catalyst is key

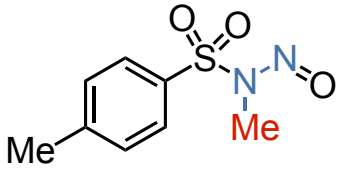
Morandi, B.; Carreira, E. M. *Science* **2012**, *335*, 1471.

Quenching

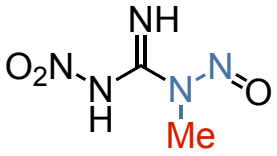
N-methyl-N-nitroso precursor



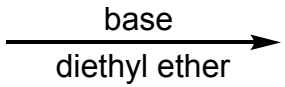
NMU

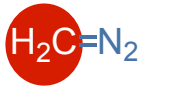


Diazald



MNNG





diazomethane

Quenching:
In an ice bath add few drops of acetic acid into reaction mixture until yellow color disappears and no more N_2 gas is produced.

Bretherick's Handbook of Reactive Chemical Hazards 6th Ed., P.G. Urben (Ed.), Oxford, Butterworth-Heinemann, 1999, ISBN 0-7506-3605-X