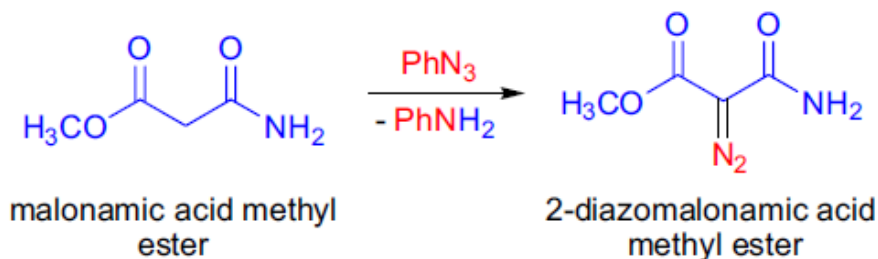


REGITZ DIAZO TRANSFER

History

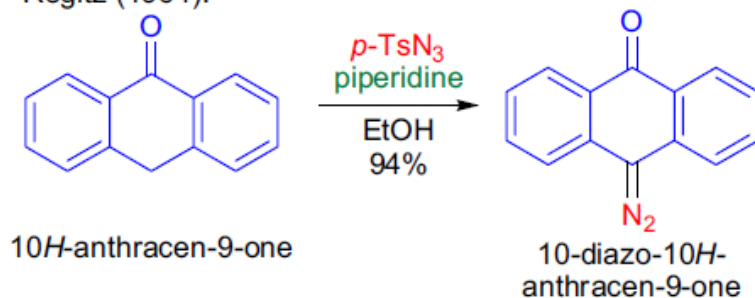
In 1910, O. Dimroth reported that the treatment of malonic acid methyl ester with phenyl azide yielded the corresponding 2-diazomalonic acid methyl ester.

Dimroth (1910):



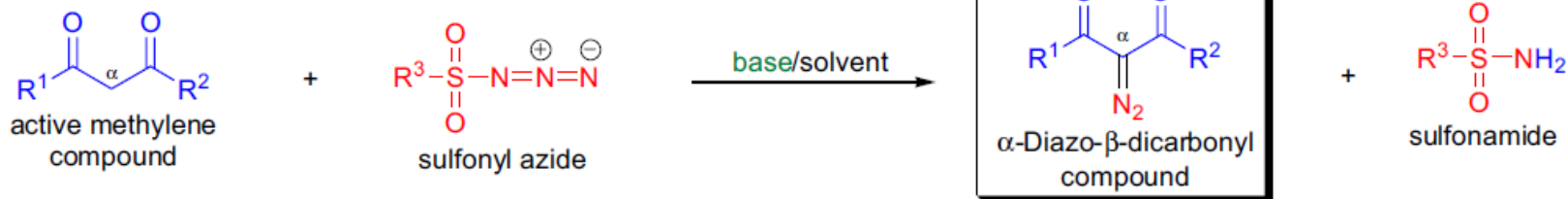
This reaction remained largely unnoticed for more than fifty years until 1964, when M. Regitz et al. investigated the reaction of arylsulfonyl azides with 1,3 diketones to afford α -diazo- β -dicarbonyl compounds.² The transfer of a diazo group to active methylene compounds using alkyl- or arylsulfonyl azides is known as the *Regitz diazo transfer*.

Regitz (1964):

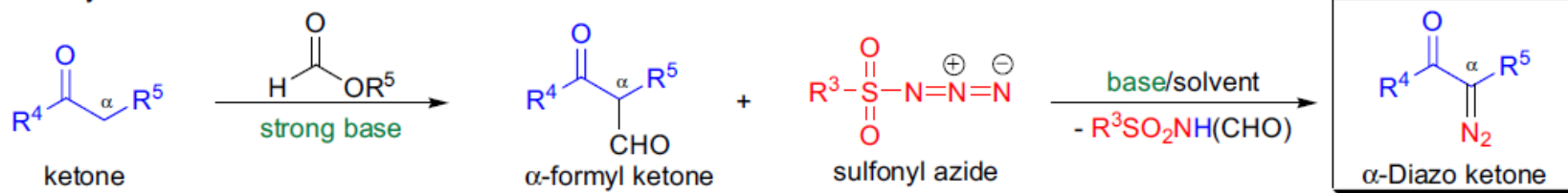


Features

Regitz diazo transfer:



Deformylative diazo transfer:

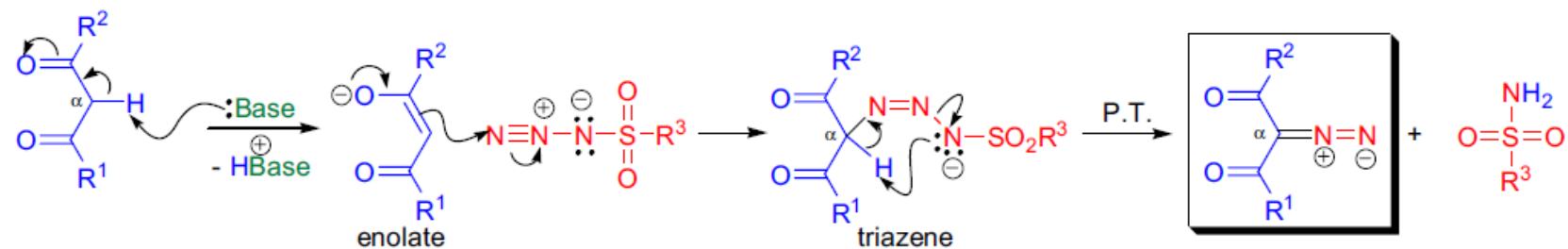


R¹⁻² = aryl, alkyl, O-alkyl, O-aryl, NH₂, NR₂; R³ = Me, *p*-tolyl, *p*-CO₂H-phenyl; R⁴ = alkyl, aryl; R⁵ = H, alkyl, aryl; base: piperidine, NEt₃, HNEt₂, KOEt, KOH; solvent: MeOH, EtOH, EtOH-H₂O, Et₂O, CH₂Cl₂, CHCl₃, acetonitrile

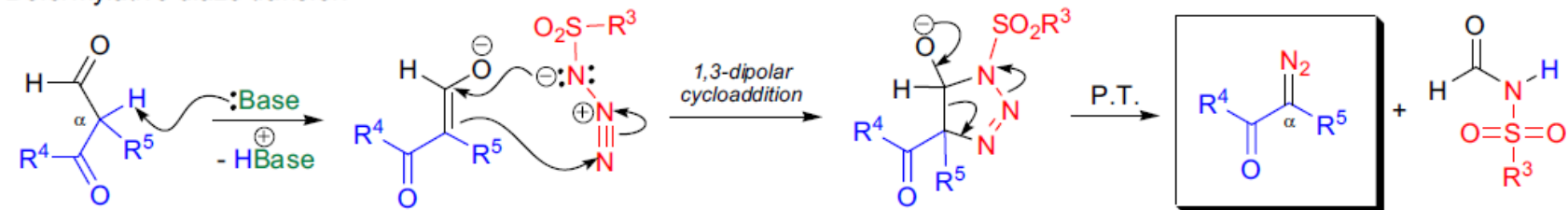
- 1) Generally weak bases such as triethylamine, diethylamine, or piperidine is appropriate, but if the acidity of the methylene group is not sufficient, the use of stronger bases (e.g., NaOEt, KOH) becomes necessary;
- 2) The azide reagent most often is an arylsulfonyl azide such as *p*toluenesulfonyl azide;
- 3) Simple cyclic and acyclic ketones usually do not react directly with sulfonyl azides, so they need to be activated by formylation (**Claisen reaction**);
- 4) when the substrate is base-sensitive, instead of formylation, trifluoroacetylation can be used, which improves the yield of the diazo ketone considerably.

Mechanism

Regitz diazo transfer:



Deformylative diazo transfer:



Applications

