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ENZYME-PROMOTED PROMISCUOUS TRANSFORMATIONS OF IMINES AND THEIR ANALOGS: NEW RESULTS

AUTHORS

Piotr KIEŁBASIŃSKI / CENTRUM BADAŃ MOLEKULARNYCH I MAKROMOLEKULARNYCH POLSKIEJ AKADEMII NAUK, SIENKIEWICZA 112,, ŁÓDŹ,

PURPOSE OF THE ABSTRACT

Presentation of new achievements in the application of enzyme catalytic promiscuity

ENZYME-PROMOTED PROMISCUOUS TRANSFORMATIONS OF IMINES AND THEIR ANALOGS: NEW RESULTS

Piotr Kiełbasiński, Małgorzata Kwiatkowska, Ignacy Janicki
Centrum Badań Molekularnych i Makromolekularnych PAN, Sienkiewicza 112, 90-363 Łódź
E-mail: piotr.kielbasinski@cbmm.lodz.pl

Enzyme catalytic promiscuity is the ability of a single enzyme active site to catalyze several chemical transformations, among them those which are different from natural.[1,2] We recently reported on the enzyme–catalyzed nucleophilic addition of nitromethane to aldimines (the aza-Henry reaction)moted addition of nitromethane to nitrones
Then we turned to iminium sa which led to synthetically useful β-nitroamines. However, to our great disappointment, this reaction proved to be non-stereoselective.[3]
Looking for other solutions we resorted to the use of various imine analogues. Thus, we first investigated addition of nitromethane to a number of nitrones. Only one of them, shown
in Scheme 1, proved reactive; However, both the yields and enantiomeric excess were moderate.

Scheme 1. Enzyme prolts. Their reaction with nitromethane led, besides the desired adduct, to various unexpected by-products, among them 2-nitroethenylarenes resulting from the retro-Michael elimination of the ammonium salt (Scheme 2).

Scheme 2. Enzyme promoted addition of nitromethane to iminium salts

Futher investigations aimed at the suppression of the consecutive reaction are in progres. The results will be discussed.

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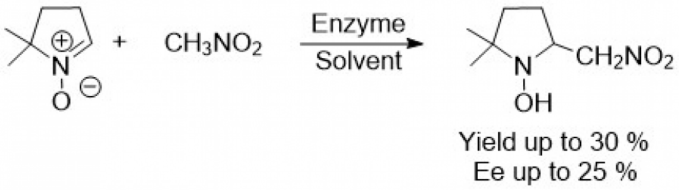
FIGURES



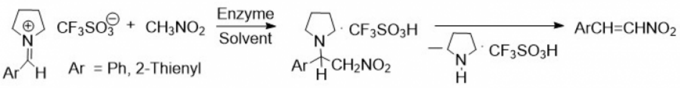


FIGURE 1

Scheme1

Scheme 1. Enzyme promoted addition of nitromethane to nitrones

FIGURE 2

Scheme 2

Scheme 2. Enzyme promoted addition of nitromethane to iminium salts

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KEYWORDS

Enzyme promiscuity | nitrones | iminium salts | addition of nitromethane to the C=N bond

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