Supporting Information

New method for in-situ generation of enolate-iminium 1,4-dipoles for [4+2] and [4+1] dipolar heterocycloaddition reactions†

Vladimir E. Zhulanov, a Maksim V. Dmitriev, a Andrey N. Maslivets, *a and Michael Rubin* b,c

a. Department of Chemistry, Perm State University, ul. Bukireva 15, Perm 614990, Russian Federation. E-mail: koh2@psu.ru
b. Department of Chemistry, North Caucasus Federal University, 1a Pushkin St., Stavropol 355009, Russian Federation
c. Department of Chemistry, University of Kansas, 1251 Wescoe Hall Dr., Lawrence, KS 66045-7582, USA. E-mail: mrubin@ku.edu; Fax: +1 (785) 864-5396; Tel: +1 (785) 864-5071
$^1$H NMR spectrum of 1a
$^1$H NMR spectrum of 1a
$^1$H NMR spectrum of 1b
$^{13}$C NMR spectrum of $1b$
$^1$H NMR spectrum of 1c
$^{13}$C NMR spectrum of 1c
H NMR spectrum of 1d

¹H NMR spectrum of 1d
$^{13}$C NMR spectrum of 1d
$^1$H NMR spectrum of 7a
$^{13}\text{C} \text{NMR spectrum of 7a}$
$^1$H NMR spectrum of 7b
$^{13}$C NMR spectrum of 7b
\(^1\text{H NMR spectrum of 8a}\)
$^{13}$C NMR spectrum of 8a
$^1\text{H NMR}$ spectrum of 8b
$^{13}$C NMR spectrum of 8b
$^1$H NMR spectrum of 8c
$^{13}$C NMR spectrum of 8c
$^1$H NMR spectrum of 9a
$^{13}$C NMR spectrum of 9a
H NMR spectrum of 9b

1H NMR spectrum of 9b
$^{13}$C NMR spectrum of 9b
$^1$H NMR spectrum of 9d
$^{13}$C NMR spectrum of 9d
The image contains an NMR spectrum labeled as \(^1H\) NMR spectrum of 10a. The spectrum includes peaks at various chemical shifts, with the molecular structure of 10a shown alongside the spectrum. The structure features a phenyl group (Ph), a bromine (Br), and a carboxylate (MeOOC) group.
$^{13}$C NMR spectrum of 10a
H NMR spectrum of 10b

1H NMR spectrum of 10b
$^{13}$C NMR spectrum of 10b
$^1$H NMR spectrum of 10c
$^{13}$C NMR spectrum of 10c
$^1$H NMR spectrum of 10d
$^{13}$C NMR spectrum of 10d
$^1$H NMR spectrum of 10e
$^{13}$C NMR spectrum of 10e
\textsuperscript{1}H NMR spectrum of 11b
$^{13}$C NMR spectrum of 11b
$^1$H NMR spectrum of 11c
$^{13}$C NMR spectrum of 11c
$^1$H NMR spectrum of 11d
$^{13}$C NMR spectrum of 11d
Figure 1. ORTEP drawing of 5a (CCDC 1457141) showing 50% probability amplitude displacement ellipsoids.

Figure 2. Packing of 5a (CCDC 1457141) in crystalline lattice. View along axis a is shown.
Figure 3. ORTEP drawing of 6c (CCDC 1457144) showing 50% probability amplitude displacement ellipsoids.

Figure 4. Packing of 6c (CCDC 1457144) in crystalline lattice. View along axis a is shown.
Figure 5. ORTEP drawing of 7a (CCDC 1457142) showing 50% probability amplitude displacement ellipsoids.

Figure 6. Packing of 7a (CCDC 1457142) in crystalline lattice. View along axis a is shown.
Figure 7. ORTEP drawing of 8a (CCDC 1457143) showing 50% probability amplitude displacement ellipsoids.

Figure 8. Packing of 8a (CCDC 1457143) in crystalline lattice. View along axis b is shown.
**Figure 9.** ORTEP drawing of 9b (CCDC 1457145) showing 50% probability amplitude displacement ellipsoids.

**Figure 10.** Packing of 9b (CCDC 1457145) in crystalline lattice. View along axis a is shown.