A Concise Synthesis of (E)-3-aryl-2,3,4,5-tetrahydro-1H-3-benzazonines by Aryne induced [2,3] Stevens Rearrangement of 1,2,3,4-Tetrahydroisoquinolines

Xuan Pan,†a Yantao Ma,†a Zhanzhu Liu* a

State Key Laboratory of Bioactive Substances and Functions of Natural Medicines, Institute of Materia Medica, Peking Union Medical College and Chinese Academy of Medical Sciences, Beijing 100050, P. R. China

*E-mail: liuzhanzhu@imm.ac.cn
$^1$H NMR spectra of compound 3a
MERCURY400 HNMR MYT2-14-1 CDCl3 20180320

$^{13}$C NMR spectra of compound 3a
MERCURY400 CNMR MYT2-14-1 CDCl3 20180323
**1H NMR spectra of compound 3b**

MERCURY500 CNMR MYT1-40-2 CDCl3 20180408

![1H NMR spectra](image)

**13C NMR spectra of compound 3b**

MERCURY500 CNMR MYT1-40-2 CDCl3 20180408

![13C NMR spectra](image)
1H NMR spectra of compound 3c

MERCURY400 HNMR MYT2-31 CDCl3 20180408

13C NMR spectra of compound 3c

MERCURY400 CNMR MYT2-31 CDCl3 20180408
$^{1}$H NMR spectra of compound 3d

MERCURY500 HNMR MYT2-32 CDCl3 20180410

![NMR spectrum of compound 3d](image)

$^{13}$C NMR spectra of compound 3d

MERCURY500 CNMR MYT2-32 CDCl3 20180410

![NMR spectrum of compound 3d](image)
**H NMR spectra of compound 3e**

MERCURY500 HNMR MYT2-23 CDCl₃ 20180326

**13C NMR spectra of compound 3e**

MERCURY500 CNMR MYT2-23 CDCl₃ 20180323
$^1$H NMR spectra of compound 3f

MERCURY500 HNMR MYT2-22 CDCl3 20180326

$^1$C NMR spectra of compound 3f

MERCURY500 CNMR MYT2-22 CDCl3 20180326
$^1$H NMR spectra of compound 3g

MERCURY500 HNMR MYT2-38 CDCl3 20180326

$^{13}$C NMR spectra of compound 3g

MERCURY500 CNMR MYT2-38 CDCl3 20180326
**1H NMR spectra of compound 3h**

MERCURY400 HNMR MYT2-16-1 CDCl3 20180410

![1H NMR spectrum](image)

**13C NMR spectra of compound 3h**

MERCURY400 CNMR MYT2-16-1 CDCl3 20180410

![13C NMR spectrum](image)
$^1$H NMR spectra of compound 3i

$^{13}$C NMR spectra of compound 3i
\(^1\)H NMR spectra of compound 3j

MERCURY500 HNMR MYT3-44 CDCl3 20180918

\(^1\)C NMR spectra of compound 3j

MERCURY500 CNMR MYT3-44 CDCl3 20180918
$^1$H NMR spectra of compound 3k

MERCURY400 MYT3-43 CDCl3 20180917

$^{13}$C NMR spectra of compound 3k

MERCURY400 CNMR MYT3-43 CDCl3 20180917
**^1H NMR spectra of compound 3l**

MERCURY HNMR MYT3-49-1 CDCl3 20180918

![^1H NMR spectrum of compound 3l](image)

**^13C NMR spectra of compound 3l**

MERCURY500 CNMR MYT3-49-1 CDCl3 20180918

![^13C NMR spectrum of compound 3l](image)
$^1$H NMR spectra of compound 3m

$^{13}$C NMR spectra of compound 3m
$^1$H NMR spectra of compound 3n

$^{13}$C NMR spectra of compound 3n
**1H NMR spectra of compound 3o**

MERCURY400 HNMR MYT3-48 CDCl3 20180918

**13C NMR spectra of compound 3o**

MERCURY500 CNMR MYT3-48-1 CDCl3 20180918
$^1$H NMR spectra of compounds $3pa$ and $3pb$

MERCURY400 HNMR MYT2-18-1 CDCl3 20180410

$^{13}$C NMR spectra of compounds $3pa$ and $3pb$

MERCURY400 CNMR MYT2-18-1 CDCl3 20180410
H NMR spectra of compound 3q

MERCURY500 HNMR MYT2-4 CDCl3 20180326

$^1$H NMR spectra of compound 3q

$^1$C NMR spectra of compound 3q

MERCURY500 CNMR MYT2-4 CDCl3 20180326

S18
NOESY of compound 3q
**1H NMR spectra of compound 3r**

MERCURY400 HNMR MYT2-19 CDCl3 20180326

![1H NMR spectrum of compound 3r](image)

**13C NMR spectra of compound 3r**

MERCURY400 CNMR MYT2-19 CDCl3 20180326

![13C NMR spectrum of compound 3r](image)
$^1$H NMR spectra of compound 3s

MERCURY500 HNMR MYT2-5-1 CDC13 20180326

$^1$C NMR spectra of compound 3s

MERCURY500 CNMR MYT2-5 CDC13 20180326
$^1$H NMR spectra of compound 3t

MERCURY400 HNMR MYT2-3-1 CDCl3 20180408

13C NMR spectra of compound 3t

MERCURY500 CNMR MYT2-3-1 CDCl3 20180408