Facile strategy to access the indolo[2,3-α]quinolizidine framework: Synthetic study on tangutorine

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1. Copies of NMR spectra S2-S34
2. Copies of 2D NMR S35-S36
H NMR of compound 6 (400 MHz, CDCl$_3$)
\[ ^{13}\text{C} \text{ NMR of compound 6 (101 MHz, CDCl}_3) \]
$^1$H NMR of compound 5 (400 MHz, CDCl$_3$)
$^{13}$C NMR of compound 5 (101 MHz, CDCl$_3$)
$^1$H NMR of compound 4 (400 MHz, CDCl$_3$)
$^{13}$C NMR of compound 4 (101 MHz, CDCl$_3$)
$^{1}$H NMR of compound 10 (400 MHz, CDCl$_3$)
$^{13}$C NMR of compound 10 (101 MHz, CDCl$_3$)
$^1$H NMR of compound 11 (300 MHz, CDCl$_3$+DMSO)
$^{13}$C NMR of compound 11 (75 MHz, CDCl$_3$+DMSO)
$^1$H NMR of compound 12 (400 MHz, CDCl$_3$)

S12
$^{13}$C NMR of compound 12 (126 MHz, CDCl$_3$)
$^1$H NMR of compound 3 (500 MHz, CDCl$_3$)
$^{13}$C NMR of compound 3 (101 MHz, CDCl$_3$)
$^1$H NMR of compound 16 (400 MHz, CDCl$_3$)
$^1$H NMR of compound 18 (500 MHz, CDCl$_3$)
$^{13}$C NMR of compound 18 (126 MHz, CDCl$_3$)
$^{1}$H NMR of compound 19 (500 MHz, CDCl$_3$)

S19
$^{13}$C NMR of compound 19 (101 MHz, CDCl$_3$)
$^1$H NMR of compound 20 (500 MHz, CDCl$_3$)
$^{13}$C NMR of compound 20 (101 MHz, CDCl$_3$)
1H NMR of compound 21 (400 MHz, CDCl₃)
$^{13}$C NMR of compound 21 (101 MHz, CDCl$_3$)

S24
$^1$H NMR of compound 22 (500 MHz, CDCl$_3$)
\(^{13}\)C NMR of compound 22 (101 MHz, CDCl\(_3\))
$^1$H NMR of compound 23 (400 MHz, CDCl$_3$)
$^{13}$C NMR of compound 23 (101 MHz, CDCl$_3$)

S28
$^1$H NMR of compound 14 (500 MHz, CDCl$_3$)
$^{13}$C NMR of compound 14 (101 MHz, CDCl$_3$)
\[ ^1\text{H NMR of compound 13 (400 MHz, CDCl}_3\]
$^{13}$C NMR of compound 13 (101 MHz, CDCl$_3$)
$^1$H NMR of compound 24 (400 MHz, CDCl$_3$)
$^{13}$C NMR of compound 24 (101 MHz, CDCl$_3$)
NOE spectrum of 13
NOE spectrum of 4

\[ \text{Chemical Structure Image} \]