Supporting Information

A Straightforward Sequence to Alkyl 1H-Pyrrole-2,5-dicarboxylates
Starting from Acylhydrazono esters and Alkyl 2-Aroyl-1-chlorocyclopropanecarboxylates

Zhimei Huang, yuefa Gong*

School of Chemistry and Chemical Engineering, Huazhong University of Science and Technology, 1037 Luoyu Road, Wuhan 430074, People’s Republic of China
gongyf@mail.hust.edu.cn

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I, $^1$H NMR spectra of the reaction product

$^1$H NMR (400 MHz, CDCl$_3$) δ 10.42 (s, 1H), 7.87 – 7.80 (m, 4H), 7.54 – 7.48 (m, 1H), 7.42 (t, $J = 7.5$ Hz, 2H), 7.03 (d, $J = 2.7$ Hz, 1H), 6.92 (d, $J = 8.8$ Hz, 2H), 6.41 (2H), 4.38 (q, $J = 7.1$ Hz, 2H), 4.11 (q, $J = 7.1$ Hz, 2H), 3.86 (s, 3H), 1.37 (t, $J = 7.1$ Hz, 3H), 0.99 (t, $J = 7.1$ Hz, 3H).

General Procedure: A mixture of 0.2 mmol of 1c, 0.2 mmol of 2a and 0.4 mmol of Cs$_2$CO$_3$ in 2mL CH$_3$CN was stirred at 80°C until the starting materials disappeared by TLC analysis. Then the solvent CH$_3$CN was removed under reduced pressure. The mixture was then washed with water and extracted with CH$_2$Cl$_2$ for three times. Combined extracts were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure. The residue was dissolved in CDCl$_3$ and measured by $^1$H NMR spectroscopy. The chemical shift at 6.41 was assigned to be the CONH$_2$ of benzamide. The residue was eluted using petroleum ether and ethyl acetate (8:1 to 2:1) on silica gel column chromatography, the product 3 and benzamide are collected.
Spectroscopic data for benzamide:

$^1$H NMR (400 MHz, CDCl$_3$) $\delta$ 7.86 – 7.78 (m, 2H), 7.54 (t, $J = 7.4$ Hz, 1H), 7.45 (t, $J = 7.5$ Hz, 2H), 6.34 (s, 2H).

$^{13}$C NMR (101 MHz, CDCl$_3$) $\delta$ 169.81, 133.21, 132.10, 128.65, 127.41.
II. NMR spectra for all new compounds

1. 3aa

![NMR spectrum of 3aa]

2. 3ba

![NMR spectrum of 3ba]
3. 3ca
5. 3ea
6. 3fa
7. 3ga
8. 3ha
11. 3ka
12. 3ab
3ab

13. 3ac
14. 3ad
15. 3ae
16. 3af
17. 3bb
18. 3cb
20. 3eb
21. 3fb
$3hb$

23. 3ib
III. Crystallographic information for 3ba
Figure 1. Crystal structure of 3ba

Figure 2. Projection of one unit cell