Electronic Supplementary Information for

Green synthesis of α-amino acids by electrochemical carboxylation of imines in a flow microreactor

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1. Linear Sweep Voltammograms

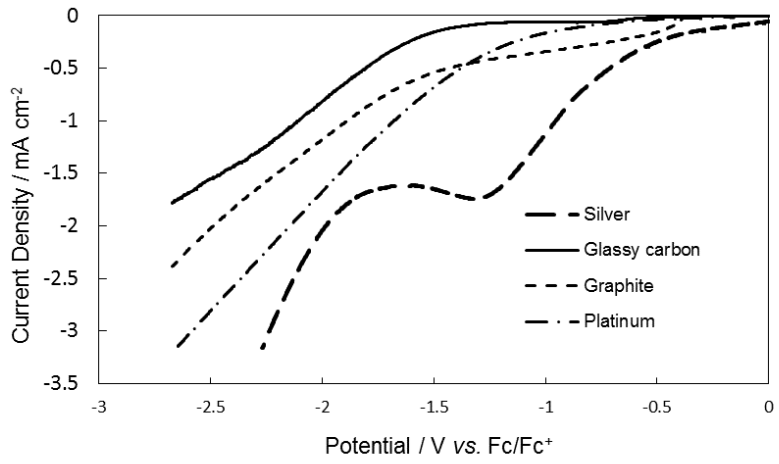


Fig. S1 Linear sweep voltammograms of the saturated CO_2 in 0.1 M Bu_4NBF_4/THF at various disk electrodes at 0.1 V s^{-1} in the scan rate at 25 ± 2 °C.

2. Determination of ^{1}H NMR Yields

After the electrolyses of imines **3**-**6**, 0.15 mL of their reaction mixtures were extracted with diethyl ether. Then, nitromethane (0.30 μL, 0.0056 mmol) as an internal standard was added to the evaporated residues. The yields of **3a**-**6a** were calculated by ^{1}H NMR measurements of these reaction mixtures with nitromethane (at 4.42 ppm) as an internal standard. Characteristic peaks of purpose products were determined by referring to the previous synthetic report [1].

The NMR yields of **3a**-**6a** were determined by following equation (2).

$$I_1 / 3N_1 = I_2 / N_2 \qquad (1)$$

$$\text{Yield (\%)} = N_2 / N_{Imine} \cdot 100\% \qquad (2)$$

where I_1 and I_2 are NMR integral values of nitromethane and product peaks, respectively; N_1 and N_2 are mole quantities of nitromethane and product in ^{1}H NMR, respectively.

However, the amino acids **3a** and **4a** were not detected at all in the corresponding ^{1}H NMR spectra. On the other hand, as shown in Figs. **S2** and **S3**, the amino acids **5a** and **6a** were detected in the corresponding ^{1}H NMR spectra, and their yields were calculated from I_1 and I_2 values shown in Table S2.

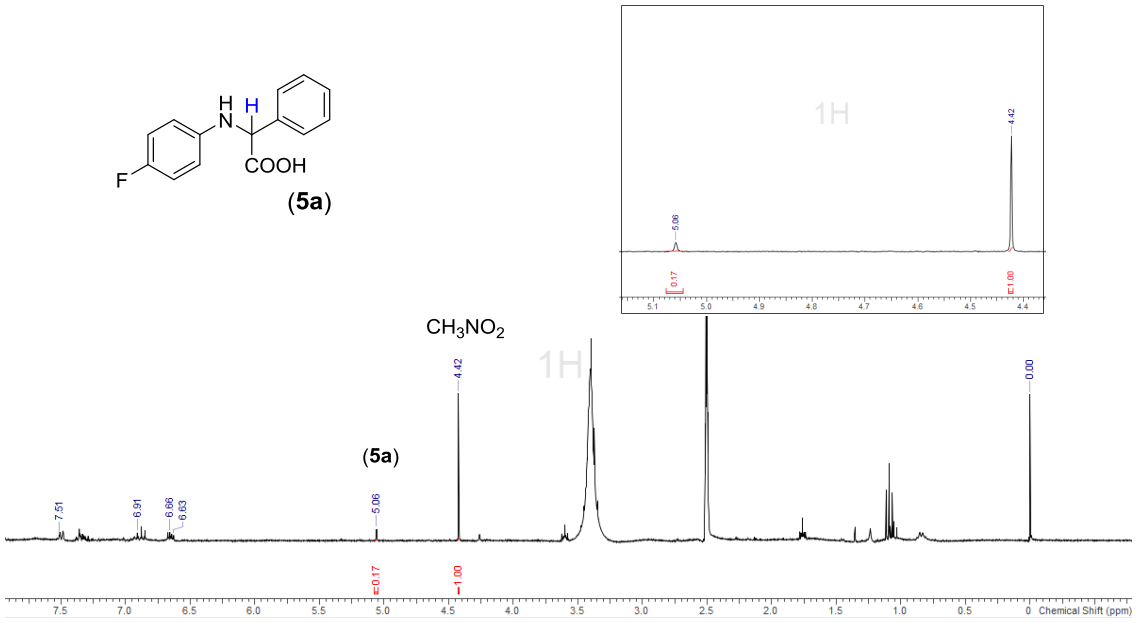


Fig. S2 ^{1}H NMR spectrum of reaction mixture after the electrochemical carboxylation of imine **5** for synthesis of **5a**.

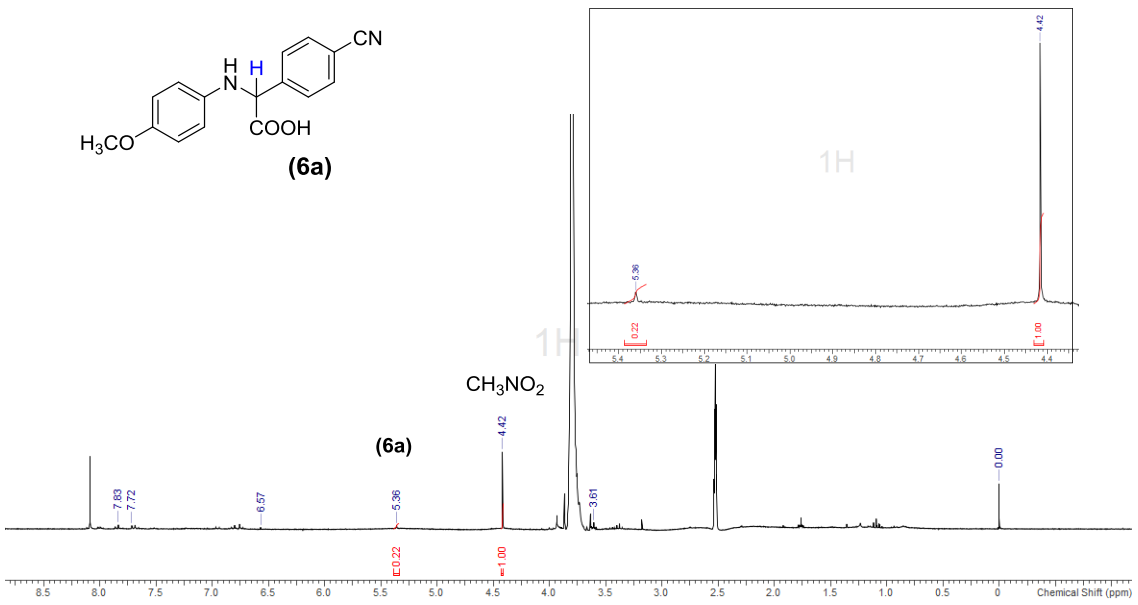
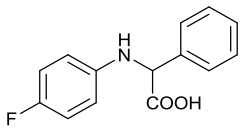
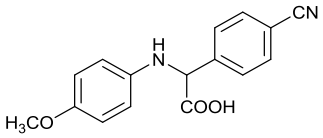


Fig. S3 ^{1}H NMR spectrum of reaction mixture after the electrochemical carboxylation of imine **6** for synthesis of **6a**.

Table S1 The I_1 and I_2 values for ^{1}H NMR yields determination

Amino acid	I_1	I_2	Yield (%)
 **5a**	1	0.17	32
 **6a**	1	0.22	41

Reference

1. A. A. Sathe, D. R. Hartline and A. T. Radosevich, *Chem. Commun.*, 2013, **49**, 5040.