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

![Graph showing linear sweep voltammograms](image)

**Fig. S1** Linear sweep voltammograms of the saturated CO₂ in 0.1 M Bu₄NBF₄/THF at various disk electrodes at 0.1 V s⁻¹ in the scan rate at 25 ± 2 °C.

2. Determination of ¹H 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 ¹H 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).

\[
\frac{I_1}{3N_1} = \frac{I_2}{N_2} \quad (1)
\]

\[
\text{Yield (\%)} = \frac{N_2}{N_{\text{imine}}} \cdot 100\% \quad (2)
\]

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 ¹H NMR, respectively.

However, the amino acids 3a and 4a were not detected at all in the corresponding ¹H NMR spectra. On the other hand, as shown in Figs. S2 and S3, the amino acids 5a and 6a were detected in the corresponding ¹H 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>
<thead>
<tr>
<th>Amino acid</th>
<th>$I_1$</th>
<th>$I_2$</th>
<th>Yield (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="" alt="Chemical Structure 5a" /></td>
<td>1</td>
<td>0.17</td>
<td>32</td>
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<tr>
<td><img src="" alt="Chemical Structure 6a" /></td>
<td>1</td>
<td>0.22</td>
<td>41</td>
</tr>
</tbody>
</table>

Reference