Supplementary Information

A High-Performance Continuous-Flow MEA Reactor for Electroreduction CO₂ to Formate

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Figure S1 Schematic of the standard H-type reactor.

Figure S2 (A) CV and (B) LSV results in flow MEA reactor with N₂ and CO₂-saturated 0.5 mol·L⁻¹ KHCO₃ solution.
**Figure S3** Chrono-amperometry result of the flow MEA reactor at -0.91 V_{RHE} with different electrolyser architectures.

**Figure S4** Chrono-amperometry result of the flow MEA reactor at different potential in 1 hour.

**Figure S5** FE of the traditional H-type reactor at -0.91 V_{RHE}.
Figure S6 FE of without bubbling CO$_2$ in electrolyser at -0.91 V$_{\text{RHE}}$.

Figure S7 LSV curves before and after every one-hour potentiostatic experiments.

Figure S8 Cell voltage of the AEM and CEM.
Figure S9 (A) FE and (B) Chrono-amperometry result of the CEM at different potential in 1 hour.

Table S1

<table>
<thead>
<tr>
<th>Catalyst</th>
<th>Potential (V vs. RHE)</th>
<th>Faradaic efficiency (%)</th>
<th>Current density (mA cm⁻²)</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cu-Sn</td>
<td>-0.91</td>
<td>89.56%</td>
<td>47.56</td>
<td>This work</td>
</tr>
<tr>
<td>SnO₂</td>
<td>-0.88</td>
<td>87%</td>
<td>45</td>
<td>1</td>
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<tr>
<td>BiNS</td>
<td>-1.74 (V vs. SHE)</td>
<td>95%</td>
<td>24</td>
<td>2</td>
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<tr>
<td>Sn</td>
<td>-1.8 (V vs. SHE)</td>
<td>78.6%</td>
<td>17.43</td>
<td>3</td>
</tr>
<tr>
<td>Pb/PtRu</td>
<td>-1.35 (V vs. RHE)</td>
<td>93%</td>
<td>55</td>
<td>4</td>
</tr>
<tr>
<td>Sn-GDE</td>
<td>-1 (V vs. RHE)</td>
<td>65%</td>
<td>15</td>
<td>5</td>
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<tr>
<td>SnO₂</td>
<td>-1.25 (V vs. RHE)</td>
<td>80%</td>
<td>15</td>
<td>6</td>
</tr>
</tbody>
</table>

Supplementary References:


