# Supplementary Informations

# Concentric-electrode organic electrochemical transistors: case study for selective hydrazine sensing

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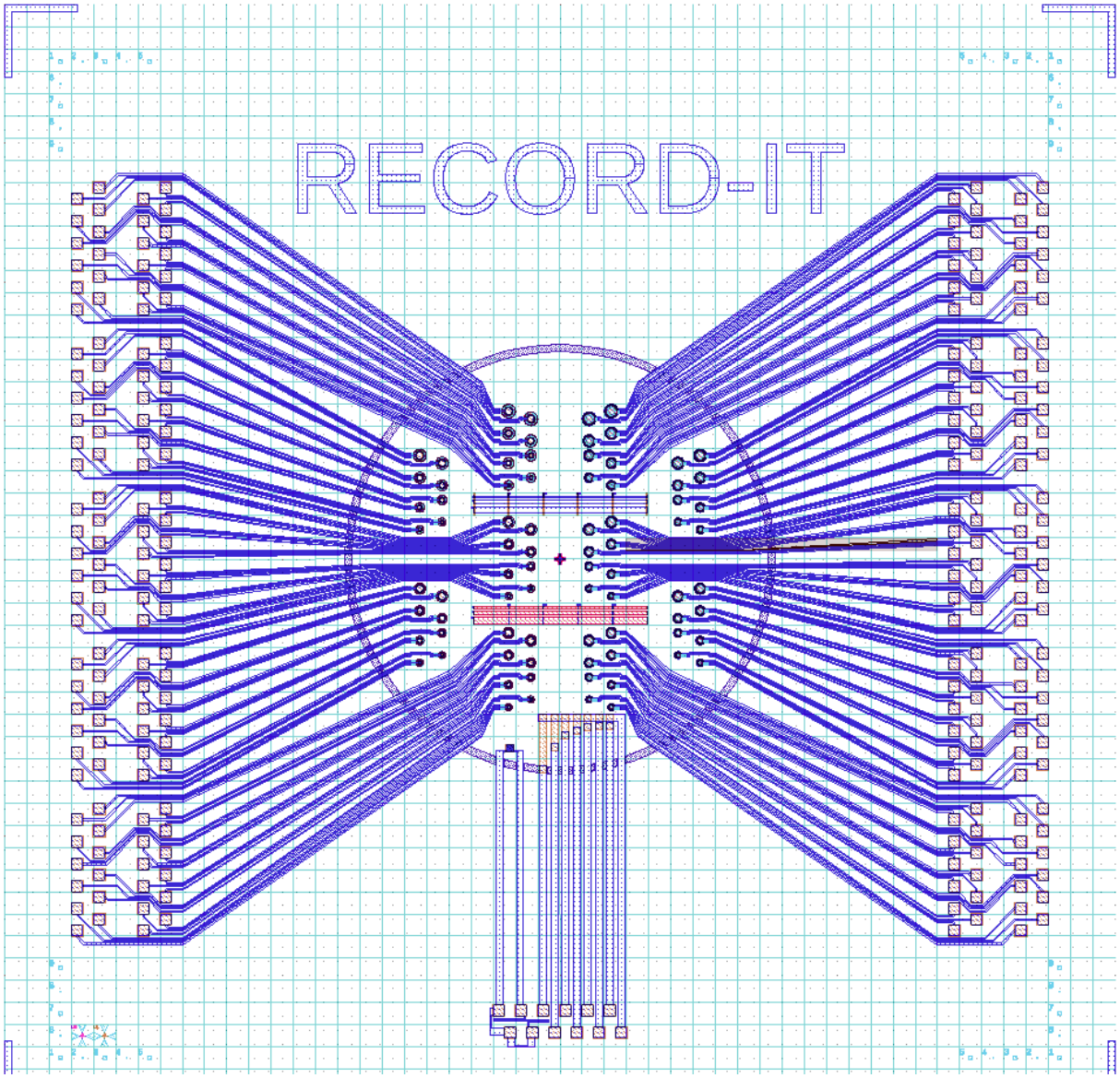


**Figure S1.** Susbtrate layout for the OECTs studied

| Device # | Geometry | Channel (µm) | | | 2·Rint | S(S) | S(D) | S(G) | S(OSC) | S(Ch) | γ'= | γ= |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Length | Width* | W/L | (µm) | (µm²) | (µm²) | (µm²) | (µm²) | (µm²) | S(OSC)/S(G) | S(Ch)/S(G) |
| 1, 2 | Gate-cent. | 20 | 489 | 24 | 100 | 4672 | 3589 | 7533 | 17461 | 9200 | 2.32 | 1.22 |
| 3, 4 | Gate-cent. | 20 | 427 | 21 | 80 | 4100 | 3026 | 4772 | 15070 | 7944 | 3.16 | 1.66 |
| 5, 6 | Gate-cent. | 20 | 364 | 18 | 60 | 3532 | 2473 | 2639 | 12714 | 6709 | 4.82 | 2.54 |
| 7, 8 | Gate-cent. | 20 | 302 | 15 | 40 | 2935 | 1901 | 1133 | 10265 | 5430 | 9.06 | 4.79 |
| 9, 10 | Gate-cent. | 10 | 464 | 46 | 100 | 4206 | 3495 | 7533 | 11986 | 4285 | 1.59 | 0.57 |
| 11, 12 | Gate-cent. | 10 | 401 | 40 | 80 | 3065 | 2931 | 4772 | 10223 | 4227 | 2.14 | 0.89 |
| 13, 14 | Gate-cent. | 10 | 338 | 34 | 60 | 3065 | 2370 | 2639 | 8455 | 3020 | 3.20 | 1.14 |
| 15, 16 | Gate-cent. | 10 | 275 | 27 | 40 | 2478 | 1801 | 1133 | 6677 | 2398 | 5.89 | 2.12 |
| 17, 18 | Gate-cent. | 5 | 451 | 90 | 100 | 3973 | 3448 | 7533 | 9484 | 2063 | 1.26 | 0.27 |
| 19, 20 | Gate-cent. | 5 | 389 | 78 | 80 | 3403 | 2883 | 4772 | 8035 | 1749 | 1.68 | 0.37 |
| 21, 22 | Gate-cent. | 5 | 325 | 65 | 60 | 2831 | 2318 | 2639 | 6582 | 1434 | 2.49 | 0.54 |
| 23, 24 | Gate-cent. | 5 | 262 | 52 | 40 | 2250 | 1752 | 1133 | 5119 | 1117 | 4.52 | 0.99 |
| 25, 26 | Gate-cent. | 2 | 444 | 222 | 100 | 3832 | 3420 | 7533 | 8058 | 806 | 1.07 | 0.11 |
| 27, 28 | Gate-cent. | 2 | 381 | 191 | 80 | 3263 | 2855 | 4772 | 6798 | 680 | 1.42 | 0.14 |
| 29, 30 | Gate-cent. | 2 | 318 | 159 | 60 | 2691 | 2289 | 2639 | 5534 | 554 | 2.10 | 0.21 |
| 31, 32 | Gate-cent. | 2 | 254 | 127 | 40 | 2112 | 1721 | 1133 | 4260 | 427 | 3.76 | 0.38 |
| 33, 34 | Gate-cent. | 1 | 442 | 442 | 100 | 3785 | 3410 | 7533 | 7596 | 400 | 1.01 | 0.05 |
| 35, 36 | Gate-cent. | 1 | 379 | 379 | 80 | 3216 | 2845 | 4772 | 6398 | 337 | 1.34 | 0.07 |
| 37, 38 | Gate-cent. | 1 | 315 | 315 | 60 | 2645 | 2279 | 2639 | 5197 | 274 | 1.97 | 0.10 |
| 39, 40 | Gate-cent. | 1 | 251 | 251 | 40 | 2066 | 1710 | 1133 | 3987 | 210 | 3.52 | 0.19 |
| 41, 42 | Source-cent. | 20 | 351 | 18 | 100 | 8134 | 3749 | 4216 | 19582 | 7699 | 4.64 | 1.83 |
| 43, 44 | Source-cent. | 20 | 289 | 14 | 80 | 5310 | 3181 | 3709 | 14938 | 6447 | 4.03 | 1.74 |
| 45, 46 | Source-cent. | 20 | 227 | 11 | 60 | 3114 | 2611 | 3199 | 10922 | 5197 | 3.41 | 1.62 |
| 47, 48 | Source-cent. | 20 | 166 | 8 | 40 | 1546 | 2035 | 2683 | 7533 | 3952 | 2.81 | 1.47 |
| 49, 50 | Source-cent. | 10 | 322 | 32 | 100 | 8034 | 3324 | 3755 | 14938 | 3581 | 3.98 | 0.95 |
| 51, 52 | Source-cent. | 10 | 260 | 26 | 80 | 5210 | 2757 | 3248 | 10922 | 2955 | 3.36 | 0.91 |
| 53, 54 | Source-cent. | 10 | 197 | 20 | 60 | 3014 | 2189 | 2737 | 7533 | 2330 | 2.75 | 0.85 |
| 55, 56 | Source-cent. | 10 | 135 | 13 | 40 | 1446 | 1617 | 2218 | 4772 | 1710 | 2.15 | 0.77 |
| 57, 58 | Source-cent. | 5 | 310 | 62 | 100 | 7984 | 3087 | 3502 | 12852 | 1781 | 3.67 | 0.51 |
| 59, 60 | Source-cent. | 5 | 247 | 49 | 80 | 5160 | 2520 | 2993 | 9149 | 1469 | 3.06 | 0.49 |
| 61, 62 | Source-cent. | 5 | 184 | 37 | 60 | 2964 | 1951 | 2479 | 6074 | 1159 | 2.45 | 0.47 |
| 63, 64 | Source-cent. | 5 | 120 | 24 | 40 | 1396 | 1376 | 1951 | 3627 | 856 | 1.86 | 0.44 |
| 65, 66 | Source-cent. | 2 | 302 | 151 | 100 | 7954 | 2944 | 3350 | 11675 | 777 | 3.49 | 0.23 |
| 67, 68 | Source-cent. | 2 | 239 | 120 | 80 | 5130 | 2377 | 2840 | 8161 | 654 | 2.87 | 0.23 |
| 69, 70 | Source-cent. | 2 | 176 | 88 | 60 | 2934 | 1807 | 2329 | 5274 | 533 | 2.26 | 0.23 |
| 71, 72 | Source-cent. | 2 | 110 | 55 | 40 | 1366 | 1227 | 1784 | 3015 | 423 | 1.69 | 0.24 |
| 73, 74 | Source-cent. | 1 | 300 | 300 | 100 | 7944 | 2896 | 3299 | 11295 | 455 | 3.42 | 0.14 |
| 75, 76 | Source-cent. | 1 | 237 | 237 | 80 | 5120 | 2329 | 2789 | 7844 | 394 | 2.81 | 0.14 |
| 77, 78 | Source-cent. | 1 | 173 | 173 | 60 | 2924 | 1759 | 2271 | 5020 | 337 | 2.21 | 0.15 |
| 79, 80 | Source-cent. | 1 | 106 | 106 | 40 | 1356 | 1176 | 1726 | 2824 | 292 | 1.64 | 0.17 |

*measured half way between the source and the drain

**Figure S2.** Geometrical properties of the 80 different OECTs

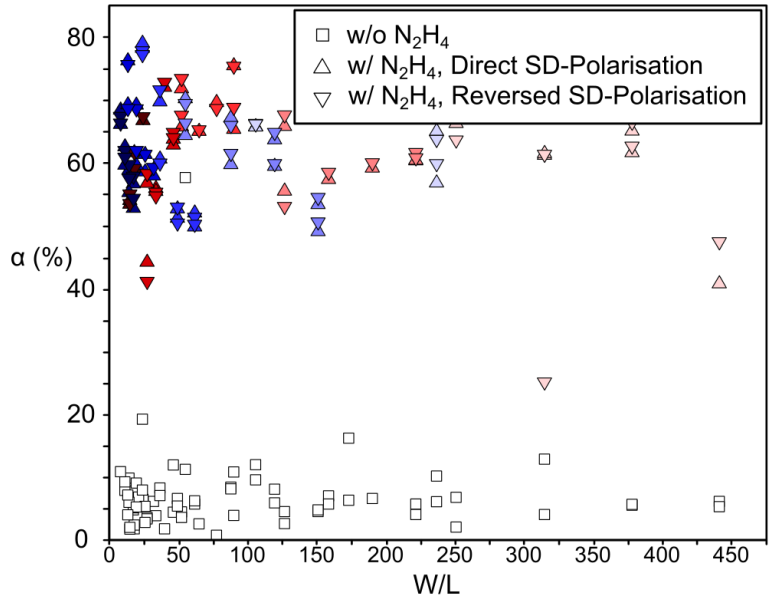


**Figure S3.** Plot of the current modulation parameter α vs. the channel width to length ratio W/L, showing no clear coupling between the effect of the channel on the device sensitivity for these large contacts OECTs. Red accounts for gate-centred OECTs and blue for source-centred ones, the lighter the colour, the shorter channel