Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Reactive oxygen species formed in organic lithium-oxygen batteries

- Supporting Information -

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Table of contents

SI-1 Influence of reduction pulse length

A Pt-ME with an active radius of r_T = 12.5 µm was used. Figure SI-1 shows multi-cycle CVs at the ME after the ME and GDE had been at OCP for 15 min. Prior to that incubation time and recording of the CV, the GDE performed ORR at E_{GDE} = -0.7 V for 120 s (Fig. SI-1A), 240 s (Fig. SI-1B) and 360 s (Fig. SI-1-1C). After 120 s a broad peak around E_{ME} = 0.3 V is noticeable in the CV recorded at the ME. With increasing duration of the reduction pulse at the GDE, two peaks develop at E_{ME} = 0.15 V and E_{ME} = 0.45 V in the subsequently recorded CV at the ME. It is very clear that the ME accumulates a soluble compound formed during the reduction pulse as increasing reduction pulse length leads to more detected products. Because the ME and the GDE are not in physical contact, this compound must diffuse across the interelectrode distance of (10 ± 2) µm.

Surprisingly, the first peak disappears in the following cycles while the second remains. Fig. SI-1D compares the first positive half cycles of Figs. SI-1A to SI-1C. This behavior is not fully understood yet and needs further investigation.

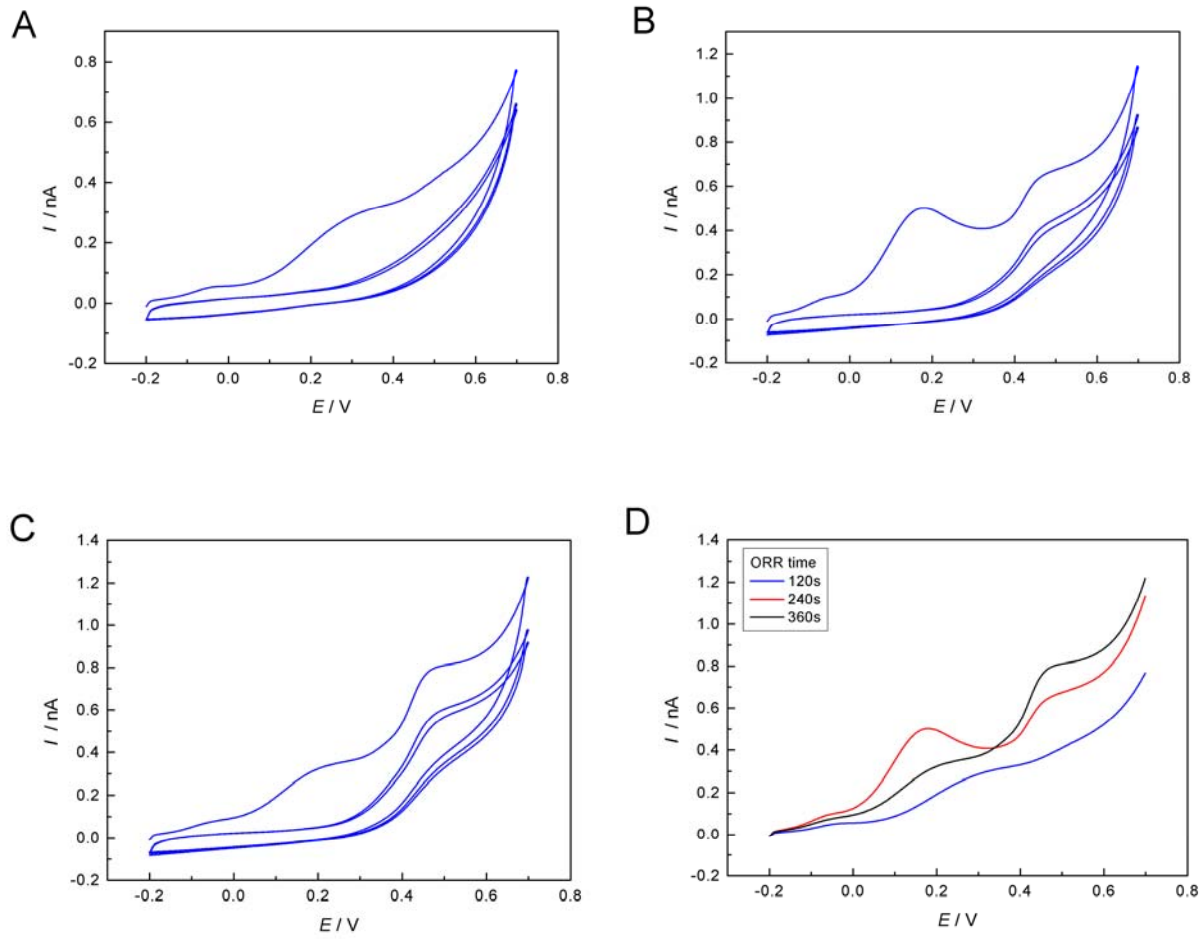

Fig. SI-1 CVs recorded at the ME after the GDE and ME were held at OCP for 15 min. Prior to that incubation time the GDE performed an ORR at E_{GDE} = -0.7 V for A) 120 s B) 240 s C) 360 s. D) Comparison of the first positive going half cycle of panels A-C.