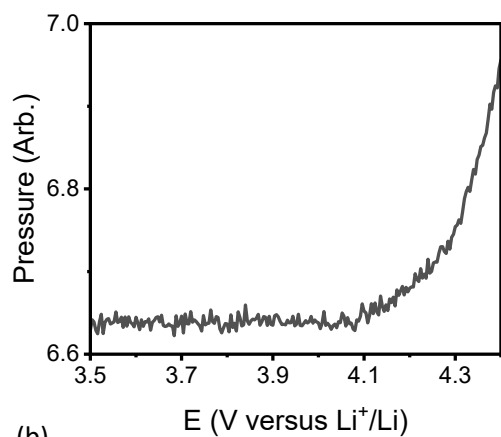
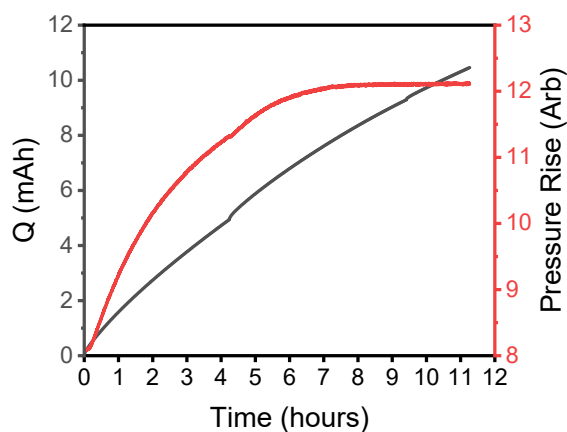


**Figure S3. Pressure monitoring during discharge and charge of the GDE in 50 mM DBDMB-50 mM TEMPO-1 M LiTFSI in DME at  $1 \text{ mA cm}^{-2}$ . 78 % of the pressure is recovered on charge, in line with a  $\text{Li}_2\text{O}_2$  yield of 80 % after discharge.**

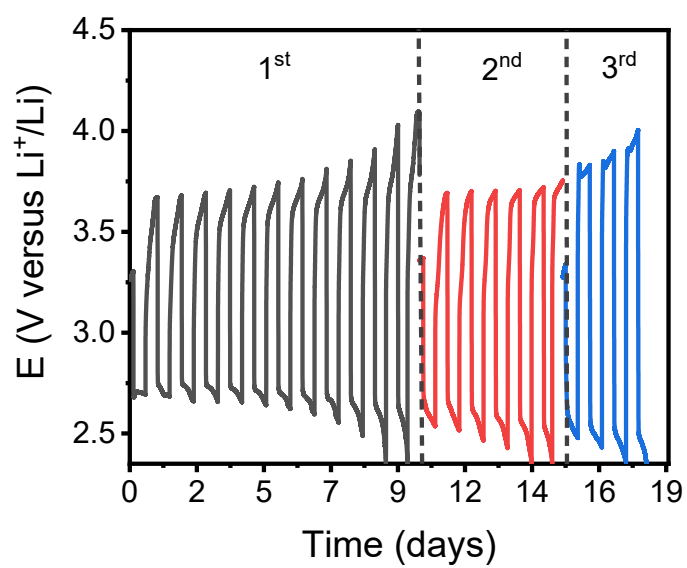
(a)



(b)



**Figure S4. Pressure monitoring measurements of gas evolution initiated by oxidation of DBDMB.** (a) Pressure monitoring during linear sweep voltammetry of the cell after the 12<sup>th</sup> charge, showing that further gas evolution begins at 4.1 V vs Li<sup>+</sup>/Li. (b) Pressure monitoring during chronoamperometry at 4.3 V vs Li<sup>+</sup>/Li after the 12<sup>th</sup> charge.



**Figure S5 - Cycling behaviour of a GDE using 50 mM DBDMB -50 mM TEMPO-1 M LiTFSI in DME.** 1<sup>st</sup> represents the GDE cycled starting with a pristine electrode. 2<sup>nd</sup> is further cycling performance after the first DBDMB<sup>+</sup> treatment. 3<sup>rd</sup> represents cycling behaviour after the second DBDMB<sup>+</sup> treatment.