Supplementary Information (SI) for EES Batteries.

Supporting Information

Comparing the Safety of Graphite and Silicon Negative Active Material in Lithium Ion Batteries

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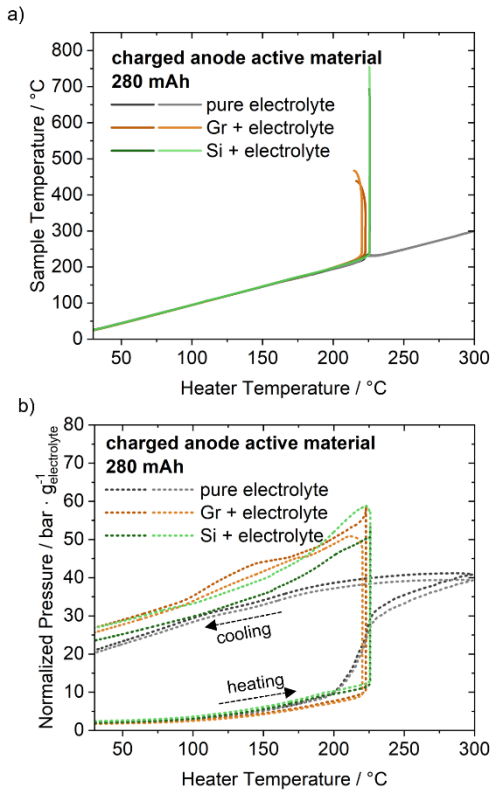

Figure S1: Heat-ramp experiments of pure electrolyte and of the combination of charged graphitic and charged Si-based electrodes with fresh electrolyte with a) the sample temperature and b) the normalized pressure plotted against the heater temperature. Since the amount of added electrolyte was adjusted to the amount of electrolyte in a complete cell (corresponding to pore volume of separator and both electrodes), the pressure was normalized to the mass of added electrolyte for improved comparability. For each experimental setup, two measurements are shown.

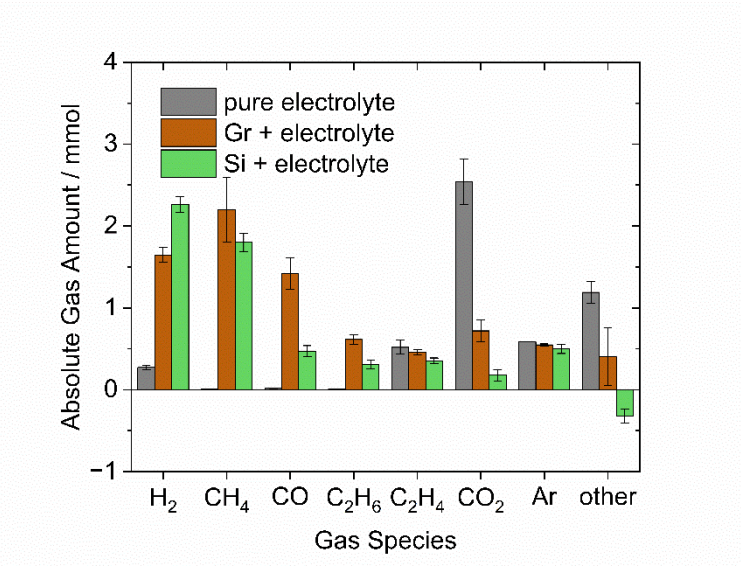

Figure S2: Gas composition of pure electrolyte and of the combination of charged graphitic and charged Si-based electrodes with fresh electrolyte after heating to 300 °C and subsequent cooling to 30 °C. The absolute gas amounts were calculated from the relative gas amounts shown in Figure 4 and the pressure difference $\Delta p_{30\,°C}$ before each measurement at 30 °C and after cooling to 30 °C (see Table 1). For the calculation, the ideal gas law was applied, which leads to systematic errors (e.g. a negative gas amount for not-detected other gases in case of Si-based electrodes), but it allows the assessment of absolute gas amounts and the consideration of different pressure buildups. Argon was calculated from the ratio of the pressure at 30 °C before and after the measurement and originated from the sample preparation in an argon-filled glovebox and the connection of the ARC vessels under an argon counterflow. Due to different $\Delta p_{30\,°C}$ for graphitic and Si-based electrodes, the shown ratios of absolute gas amounts slightly differ from the relative gas amounts in Figure 5.