



Figure 1: EXAFS data (top  $\chi(k)$ , center  $\text{Re}\{\chi(R)\}$ , bottom  $\chi(R)$ ) and fit (grey line), for Ph<sub>2</sub>C<sub>4</sub>Te (black, left) and the lithiated mixture (red, right) described in the text. The fit for Ph<sub>2</sub>C<sub>4</sub>Te includes scattering paths from two acetylene groups and four multiple scattering paths. The  $\sigma^2$  value from the Ph<sub>2</sub>C<sub>4</sub>Te fit was used as a basis for fitting the Li-containing material.

Supplementary Material