Molecular conductance of diaryl amine capped carbon-bridged oligo(phenylene vinylene)s

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Molecules featuring topological edge states, like unpaired spins localized at the molecular termini, are known for their increasing molecular conductance as a function of the number of bridging repeating units[1]. This poses an exception to the universal rule of conductance decay in respect to molecule length, rendering them excellent candidates for the use as molecular wires by diminishing and even reversing electrical signal loss.

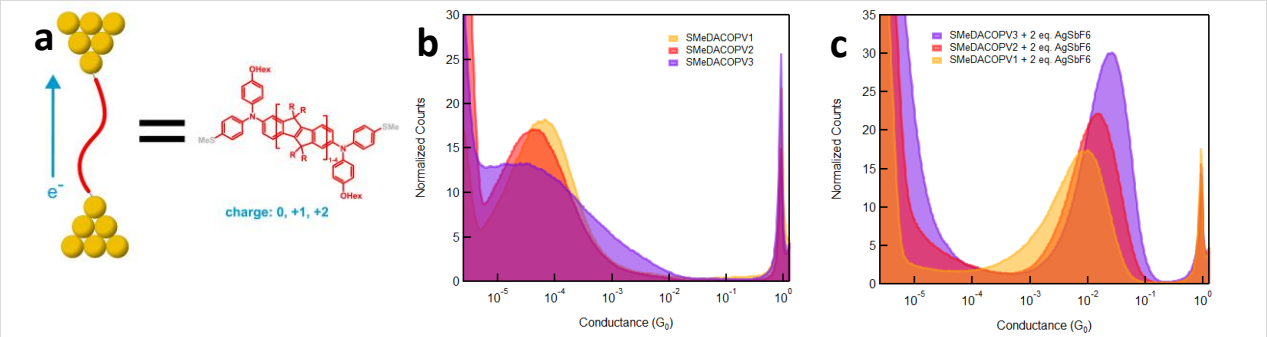

Figure 1: Schematic representation of the employed STM-BJ method (a). Conductance histograms of the neutral series (b) the oxidized series (c).

Diaryl amine-capped carbon-bridged oligo(phenylene vinylene)s express excellent charge transport characteristics[2] and offer two redox centers to create topological states. We investigate the molecular conductance of a series of 1-3 repeating units in their neutral and cationic states *via* STM break junction, revealing notable conductance values for neutral molecules of these dimensions, as well as the intended reverse conductance decay for the oxidized species.

References:

[1] L. Venkataraman, et al., Nat. Chem. 2022, 14, 1061-1067.
[2] E. Nakamura, et al., Angew. Chem. Int. Ed. 2017, 56, 2898-2902.