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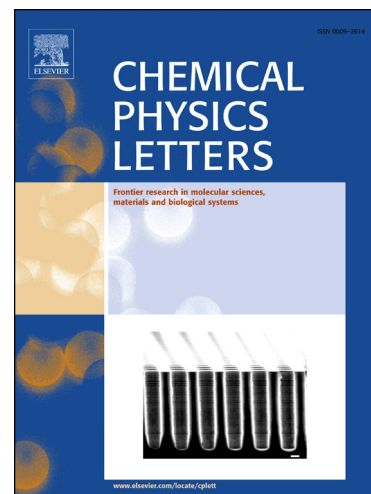
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# Highly-polarized spin currents through protein-like single-helical molecules

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## Abstract

Electronic transport through a protein-like single-helical molecule is theoretically studied. By introducing an additional terminal to couple to the molecule, we construct a two-channel mesoscopic circuit, and then calculate the charge and spin currents in the two drain terminals. It is found that in one drain terminal, one pure spin current has an opportunity to appear without any accompanying charge current. Besides, the polarization direction of the spin current can be inverted. With respect to the current in the other drain, it is also found to be highly polarized, with its polarization direction different from that in the other terminal. These results suggest that the protein-like single-helical molecule is a promising candidate for building the two-channel setup in spintronics.

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Keywords: Single-helical molecule; Electron transport; Spin polarization

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