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Optical Spectroscopy of Doped Carbon Nanotubes

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Doping of semiconductors is key for providing electronic and photonic device functionality. However, doping of semi-conducting single-wall carbon nanotubes (s-SWNTs) still lacks the sophistication and finesse to become technologically viable. Recent spectroscopic evidence suggests that surplus charge carriers in s-SWNTs are frequently trapped by adsorbed counterions which act as “killer defects”. Such carrier localization can most likely be attributed to weak screening in low-dimensional systems and points to serious fundamental challenges toward fabrication of functional semiconductor devices from nanoscale materials.

