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The role of composition-dependent catalyst structure on chirality distributions of as-grown SWCNTs

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The exemplary physiochemical properties of single-walled carbon nanotubes (SWCNTs) are largely determined by their diameter and chiral angle, specified as chiral indices (n,m) . Despite the significant progress that has been made in purifying mixtures of SWCNTs to obtain monodisperse samples (in terms of chirality), large-scale applications require improvements in the homogeneity of as-grown SWCNTs. Recent reports have shown that a potential route to controlling the chirality distribution of SWCNTs during growth is through catalyst design [1,2]. In this talk, we present our approach which is based on tuning the catalyst composition, independent of size, to perturb the catalyst structure and ultimately influence the SWCNT chirality. 1. Harutyunyan et al., Science 326, 116 (2009). 2. Chiang et al., Nature Mater. 8, 882 (2009).