Why do carbon nanotubes grow chiral? EVGENI PENEV, VASILII
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bon nanotubes (CNT) hold enormous technological promise. It can turn into reality
only if one can control in a practical way the CNT chirality—the geometric feature
of the tubular carbon topology that governs the CNT electronic properties. Ex-
perimental efforts over the last decade have consistently revealed a puzzling strong
preference towards specific chiral CNT grown via catalytic chemical vapor deposi-
tion, challenging any existing hypotheses and turning chirality control even more
elusive. Here we investigate the roles of different factors in shaping the chirality
distribution of CNT yield, including nanotube-catalyst interface [1], the energetic
landscape of CNT caps [2], or growth kinetics [3], building upon our “Nanoreactor”
framework developed for graphene synthesis [4]. Our theory shows promise in ex-
plaining narrow chirality distributions seen in multiple recent experimental studies.


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