

TABLE I: Measured RBM frequencies  $\omega_{\text{RBM}}$  and transition energies  $E_{22}^S$  and  $E_{11}^M$ . The data are grouped according to the branches in the Kataura plot. The number of tubes within a branch increases for larger diameter.

chiral index	(9,1)	(8,3)	(7,5)			
$\omega_{\text{RBM}}$ (cm <sup>-1</sup> )	306.2	297.5	283.3			
$E_{22}^S$ (eV)	1.78	1.857	1.915			
chiral index	(11,0)	(10,2)	(9,4)	(8,6)		
$\omega_{\text{RBM}}$ (cm <sup>-1</sup> )	266.7	264.6	257.5	246.4		
$E_{22}^S$ (eV)	1.657	1.690	1.72	1.73		
chiral index	(12,1)	(11,3)	(10,5)	(9,7)		
$\omega_{\text{RBM}}$ (cm <sup>-1</sup> )	236.5	232.6	226.1	216.0		
$E_{22}^S$ (eV)	1.551	1.570	1.578	1.564		
chiral index	(10,1)	(9,3)	(8,5)	(7,7)		
$\omega_{\text{RBM}}$ (cm <sup>-1</sup> )	276.3	272.7	262.7	247.8		
$E_{11}^M$ (eV)	2.38	2.425	2.470	2.450		
chiral index	(13,1)	(12,3)	(11,5)	(10,7)	(9,9)	
$\omega_{\text{RBM}}$ (cm <sup>-1</sup> )	220.3	217.4	212.4	204.0	195.3	
$E_{11}^M$ (eV)	2.057	2.075	2.084	2.067	2.024	
chiral index	(15,0)	(14,2)	(13,4)	(12,6)	(11,8)	(10,10)
$\omega_{\text{RBM}}$ (cm <sup>-1</sup> )	201.5	-	195.3	189.6	182.7	175.7
$E_{11}^M$ (eV)	1.863	-	1.934	1.942	1.935	1.889