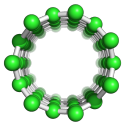
Name: _____ Date: _____

Carbon Nanotubes

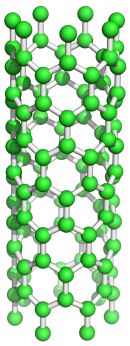
Carbon nanotubes (CNTs) can be classified in terms of their geometry, as being *chiral*, or *achiral*. There are two types of achiral CNTs: *armchair* and *zigzag*. CNTs can also be classified in terms of their electrical conductivity, as being *semiconductors* or *metallic* conductors.

Classify the following CNTs according to their geometry and conductivity. The figures were created using CNTbands on nanoHUB.

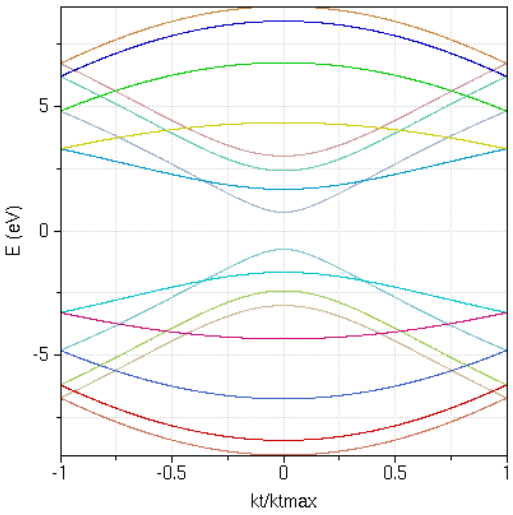
Top view



Side view



Band Diagram



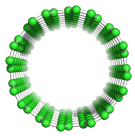
Geometry:_____

Explain your reasoning:

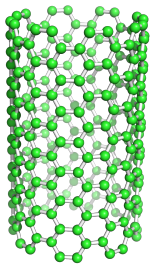
Conductivity: _____

Explain your reasoning:

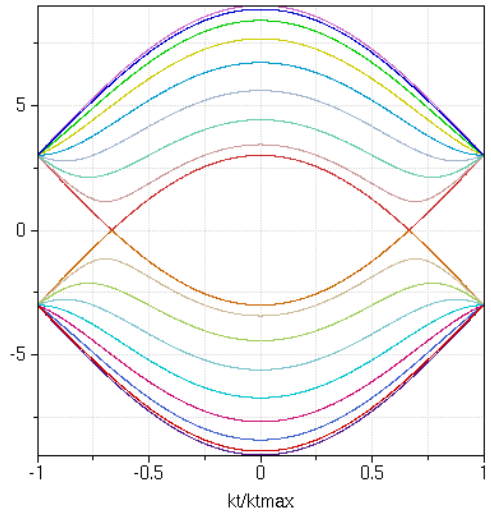
Top view



Side view



Band Diagram



Geometry:_____

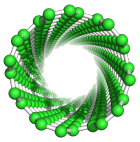
Explain your reasoning:

Conductivity: _____

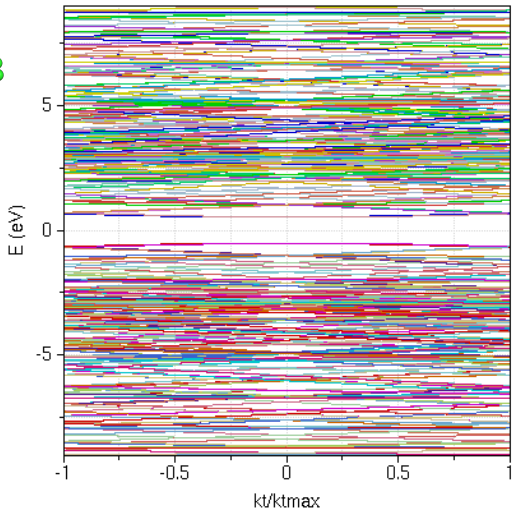
Explain your reasoning:

Classify the following CNTs according to their geometry and conductivity.

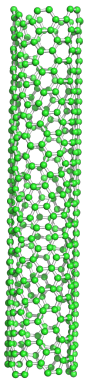
Top view



Band Diagram



Side view



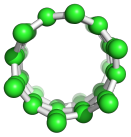
Geometry:_____

Explain your reasoning:

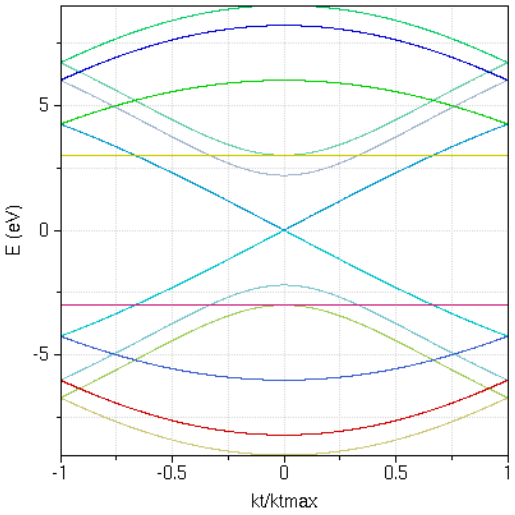
Conductivity: _____

Explain your reasoning:

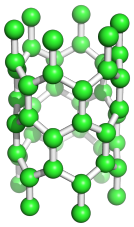
Top view



Band Diagram



Side view



Geometry:_____

Explain your reasoning:

Conductivity: _____

Explain your reasoning:

What geometry would a (7,7) CNT have? _____

What type of conductivity would a (6,0) CNT have? _____

You can check your work using https://nanohub.org/tools/cntbands-ext