Carbon

For this PowerPoint, in your notes only write what is GREEN

Carbon

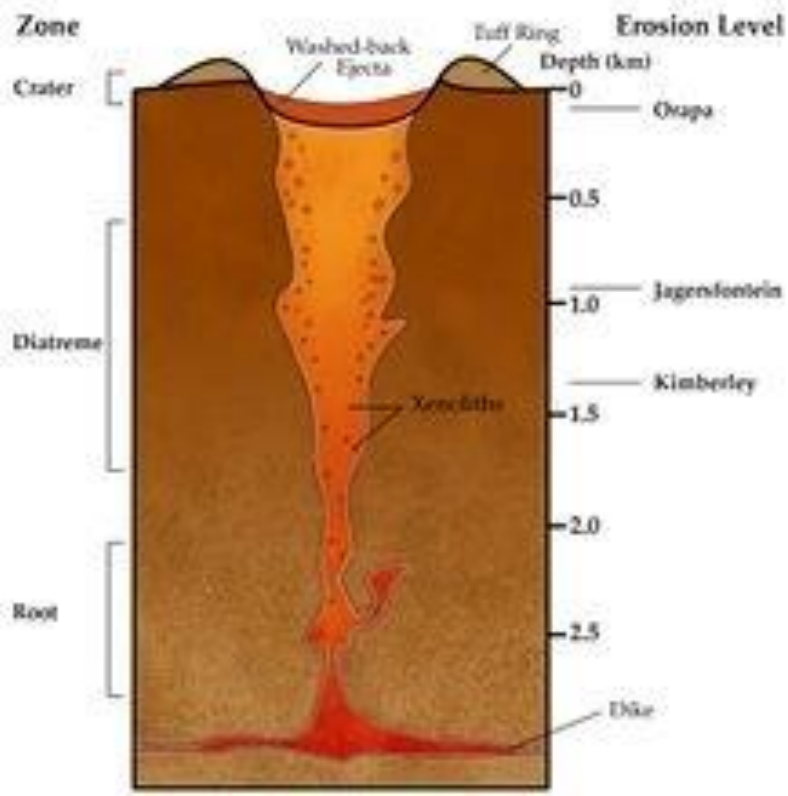
- Is the 6th most common element on Earth.
- 94% of the 6 million known compounds contain carbon.
- Carbon has a central role in the chemistry of living things
- Carbon, in the form of diamond, is the hardest mineral on Earth.
- Compounds of carbon are coal, natural gas and oil.

Carbon alone (pure)

- Forms graphite and diamond.
- Graphite is soft and slippery
- Diamond is the hardest natural substance known to man
- The difference is the way carbon bonds with each other.

Diamonds…

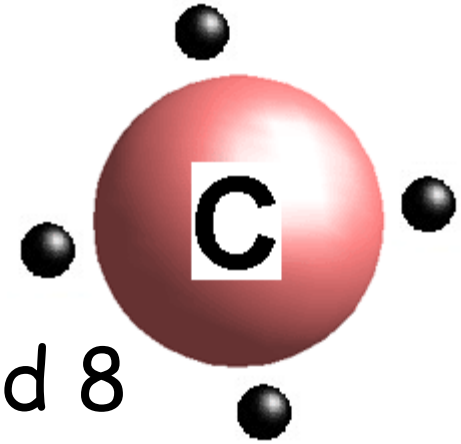
- Pure carbon
- Diamond have atoms so tightly bonded together that they are the hardest substance known.
- Very high pressure and temperature is needed to form diamond from carbon atoms



Graphite

- Pure carbon
- Black, soft, harder than coal, but way softer than diamond.
- Graphite is carbon in sheets.
- These sheets can be reshaped to make new shapes and this idea is big in nanotechnology

Electrons



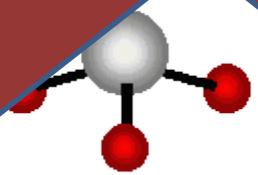
- Has four valence electrons
- Since the energy shell can hold 8 electrons, each carbon atom can share electrons with up to four different atoms.
- Can make 4 bonds
- Carbon can combine with other elements and itself.
- Forms many different compounds of <u>different sizes and shapes.</u>

Carbon bonding

- Very strong covalent bonds between carbon atoms in each layer
- But only weak forces exist between layers.
- Can make: single bonds
  double bonds
  triple bonds

SHAPES

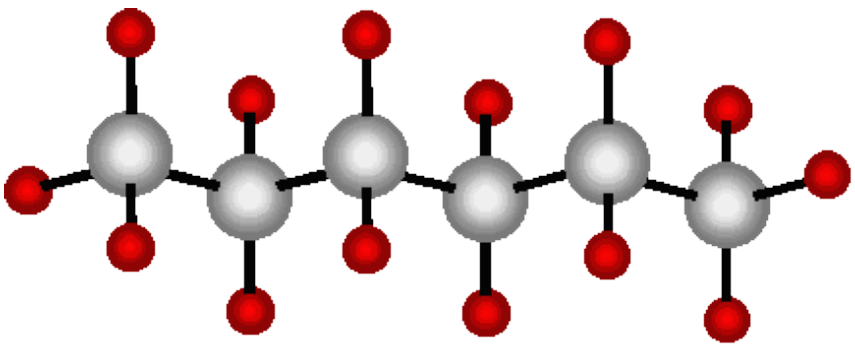
- Tetral



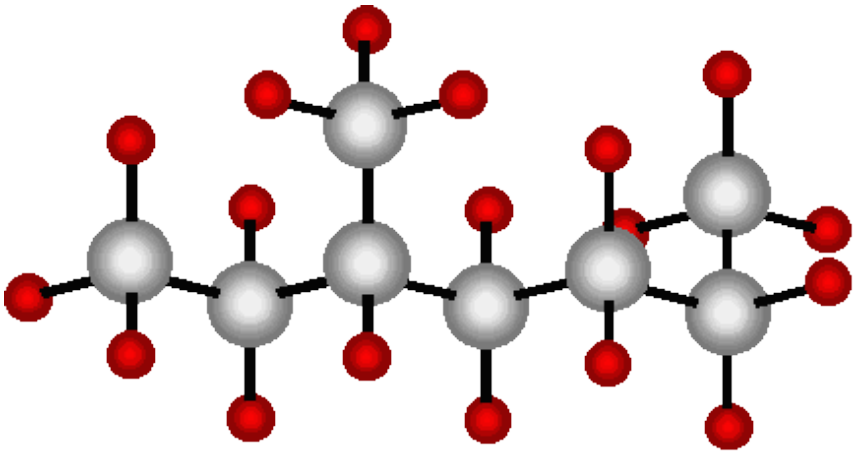
- Linea

More ways carbon can be arranged:

Straight chains

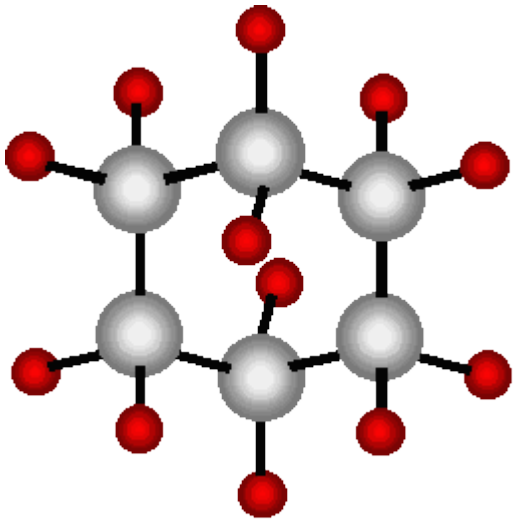


Branch chains



More . . . .

Rings – a portion of a buckyball

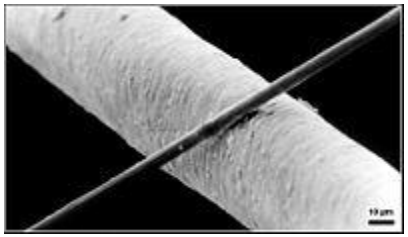


Buckyballs

- Basically when you take carbon filaments and roll them up into ball – like a geodesic dome, you get an incredibly strong and lightweight material used in space technology, sports equipment…

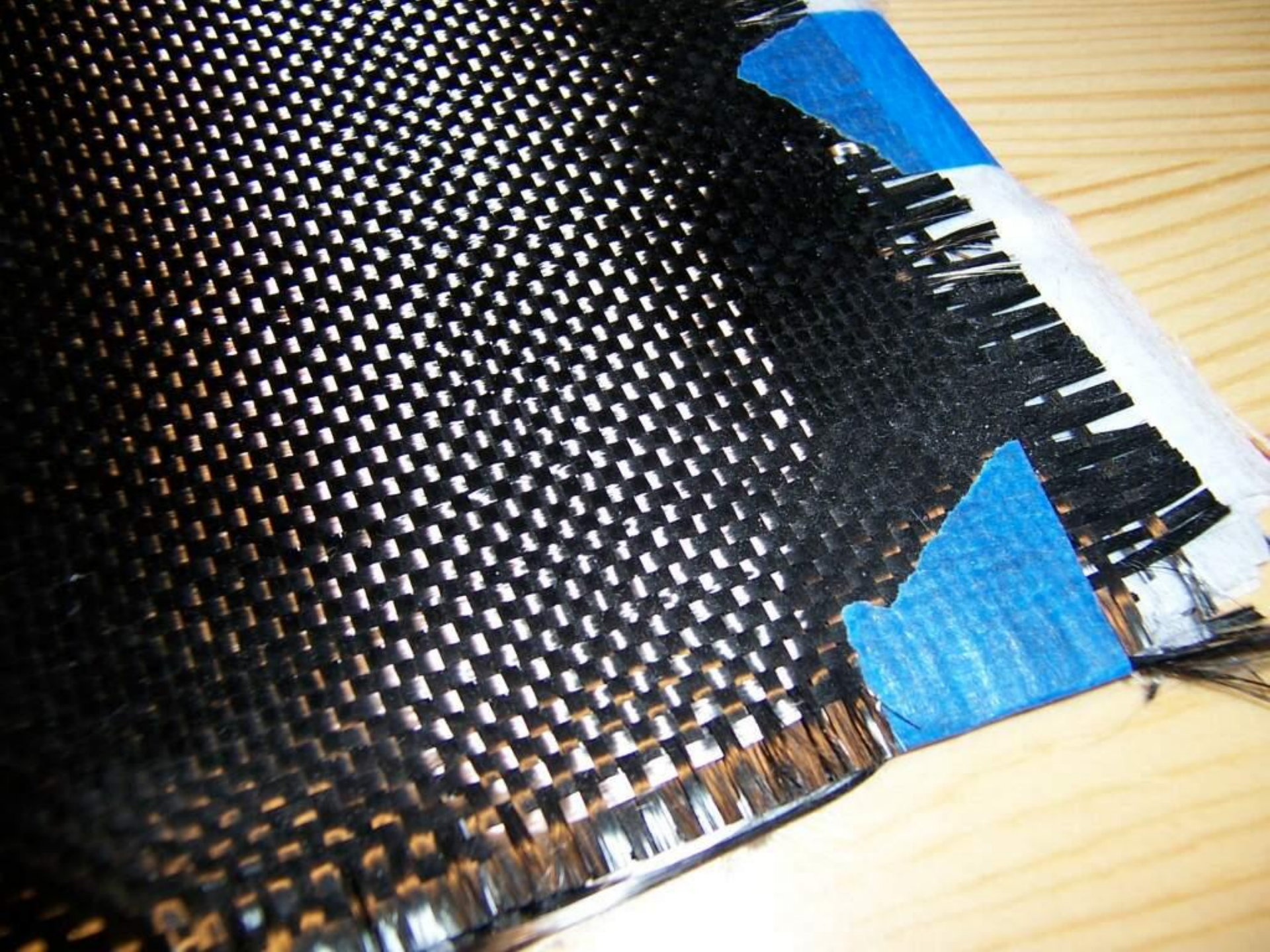
Carbon filaments

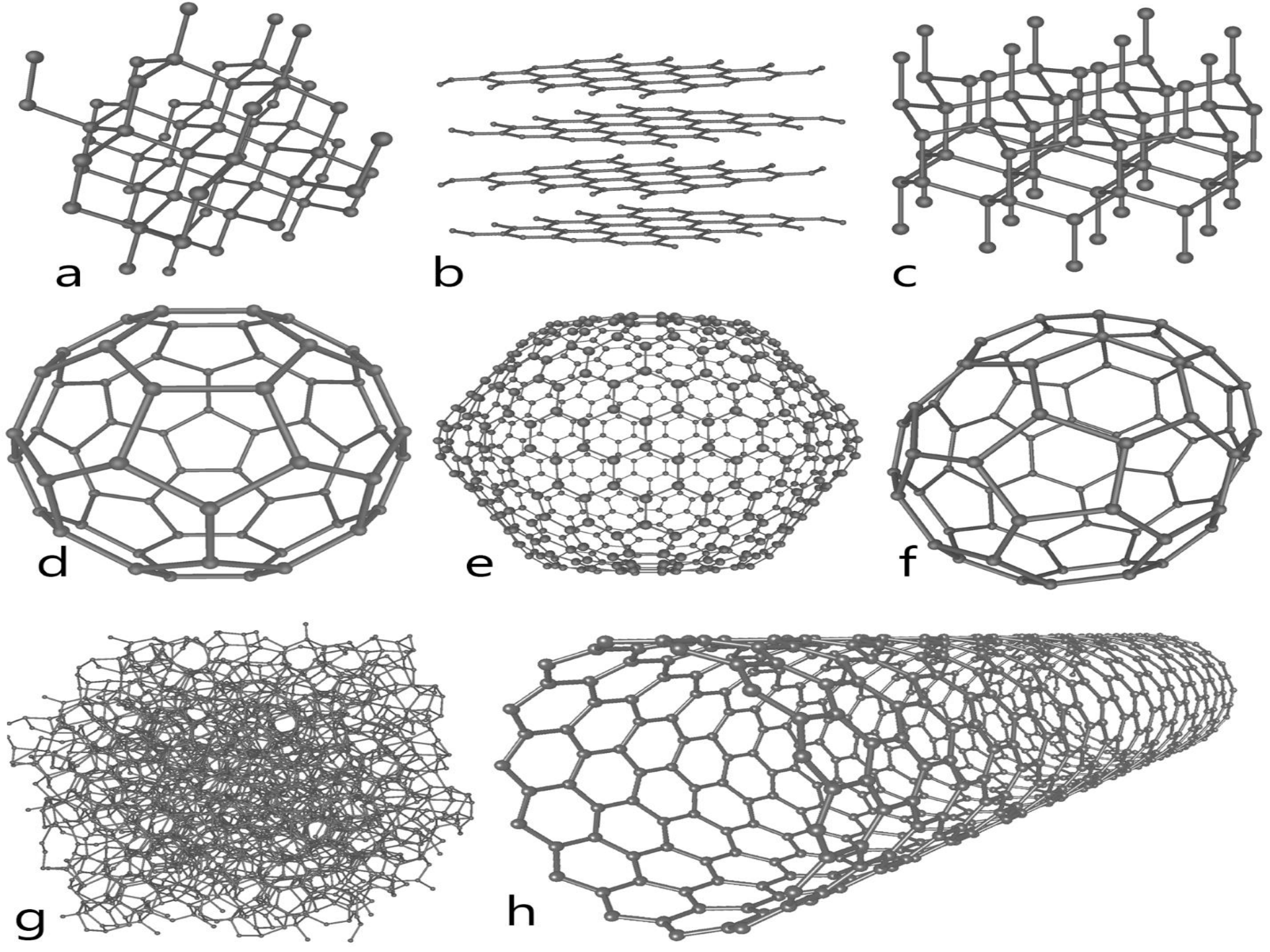
- So, graphite is carbon as one plane.
- Take carbon and roll it into nanotubes or buckyballs.
- New ideas in chemistry since 1991

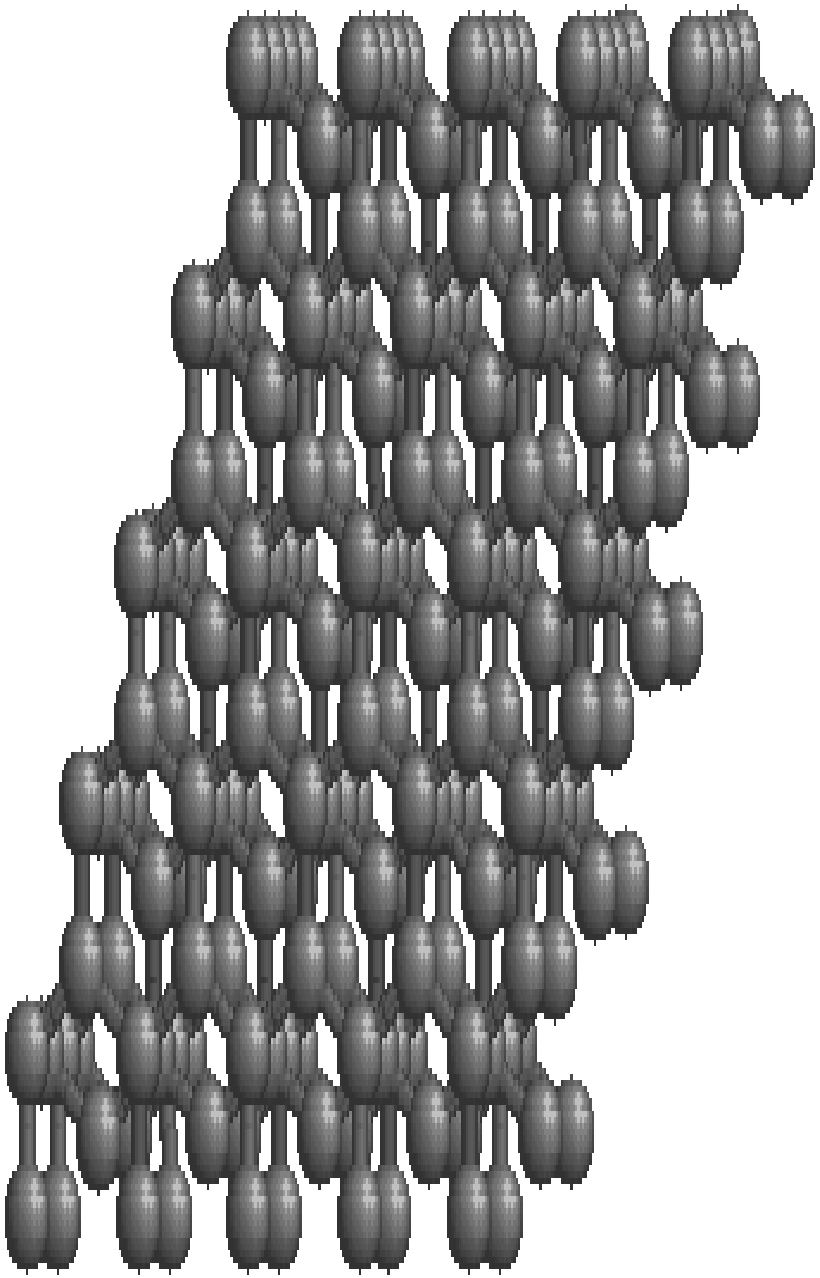


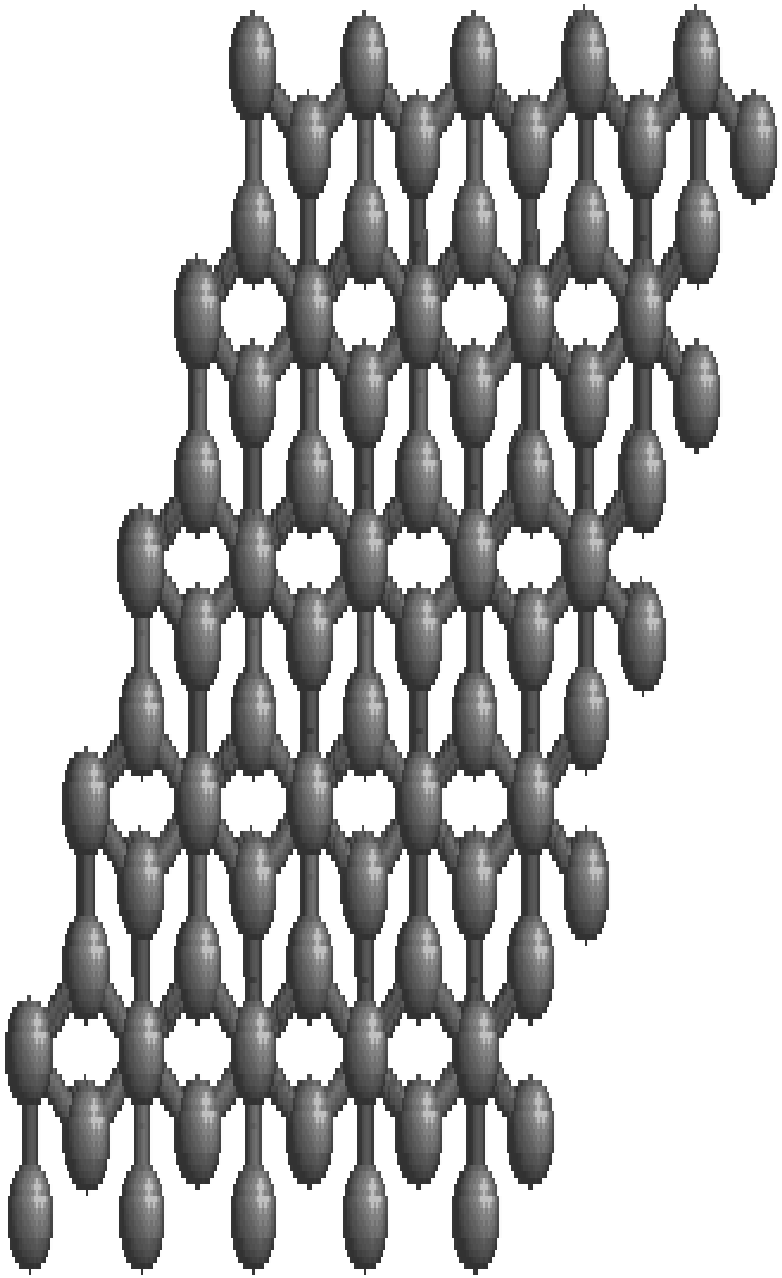
Why is carbon so special?

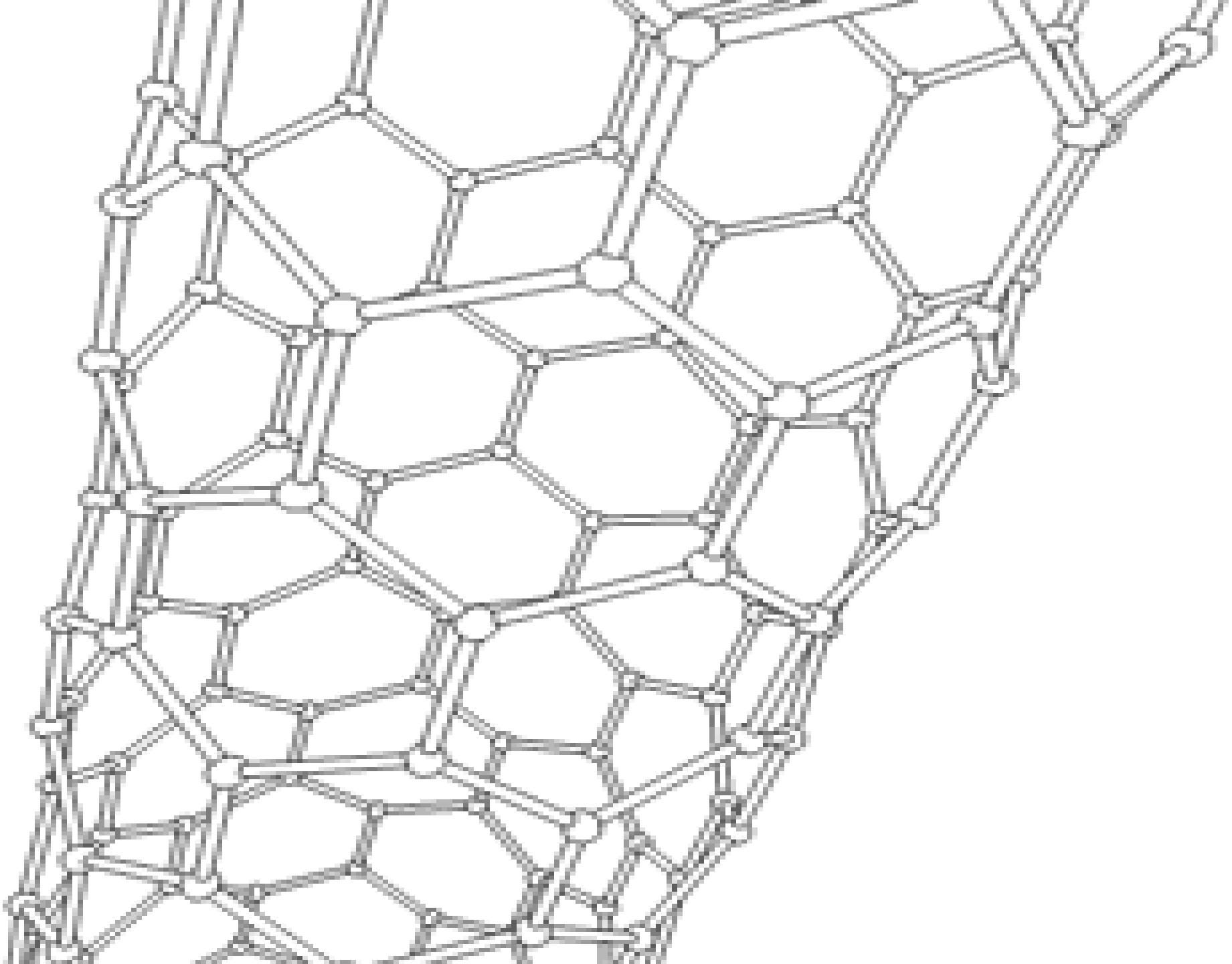
- Because it can form so many compounds.
- It can form strong links with four other atoms.
- It can link in chains, making polymer chains. These links are chemical bonds.
- These links cannot be broken by water, air, or bacteria.
- These items stay in our landfills for a long time.

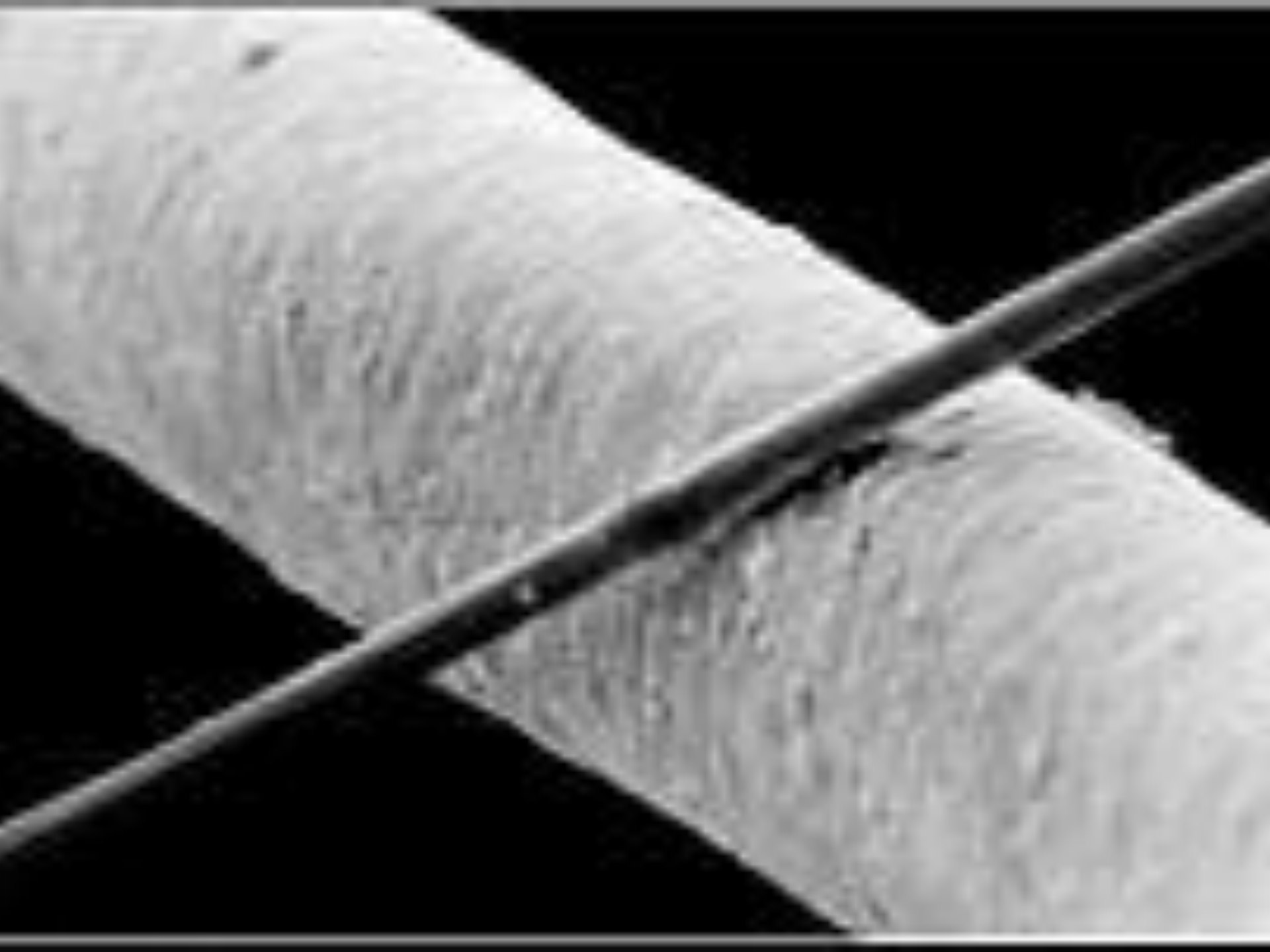


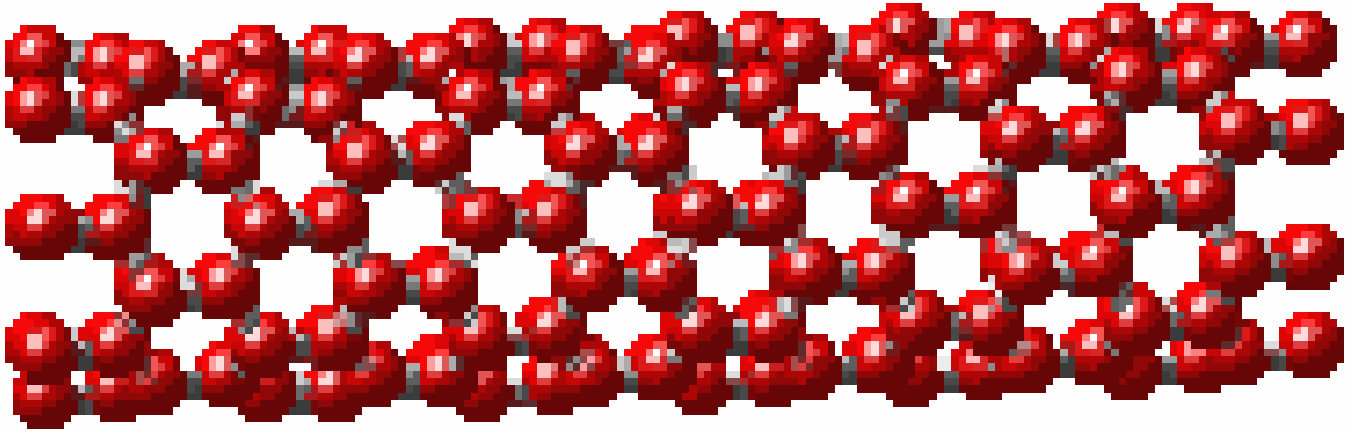

a
b
c
d
e
f
g
h

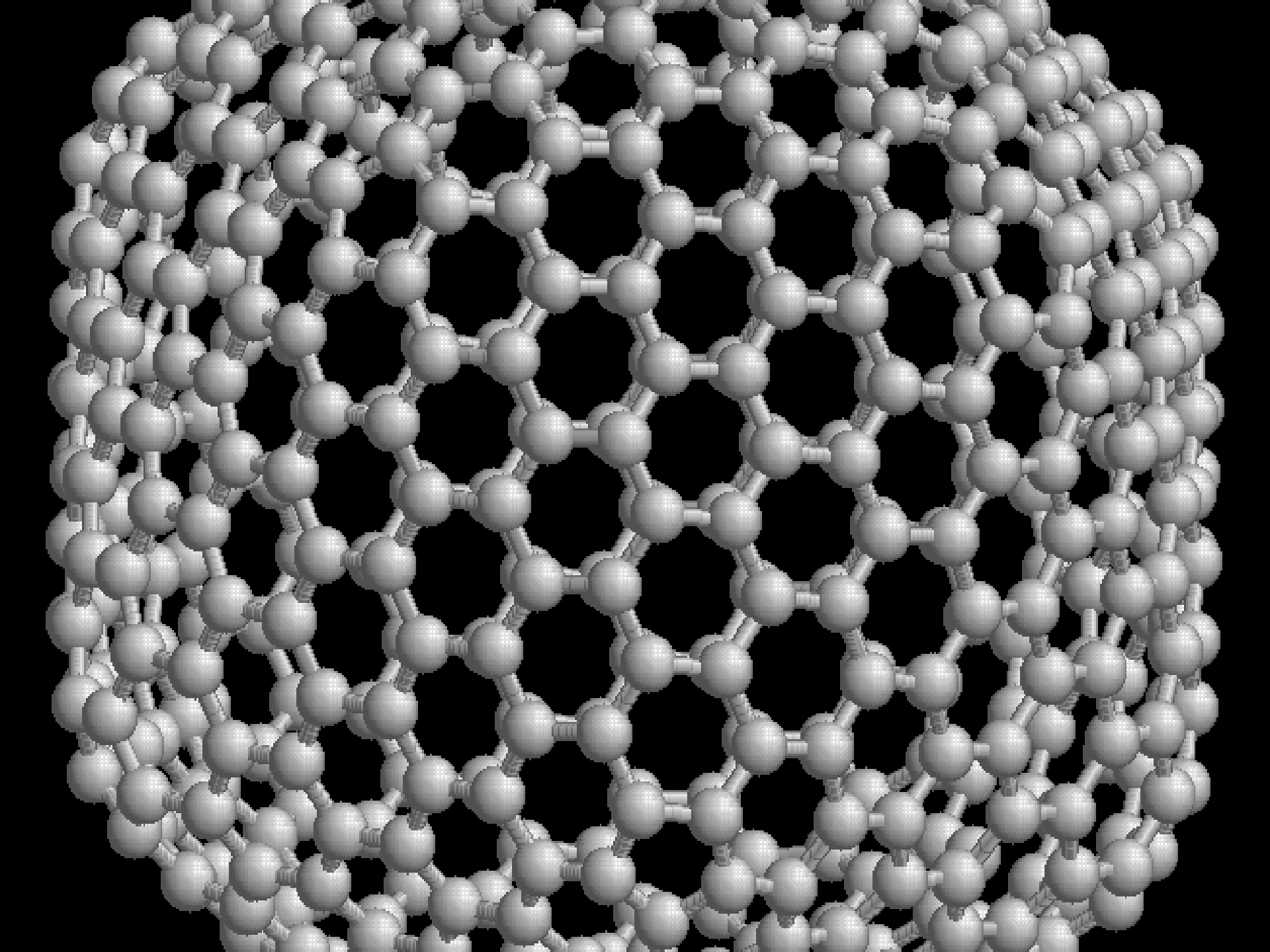








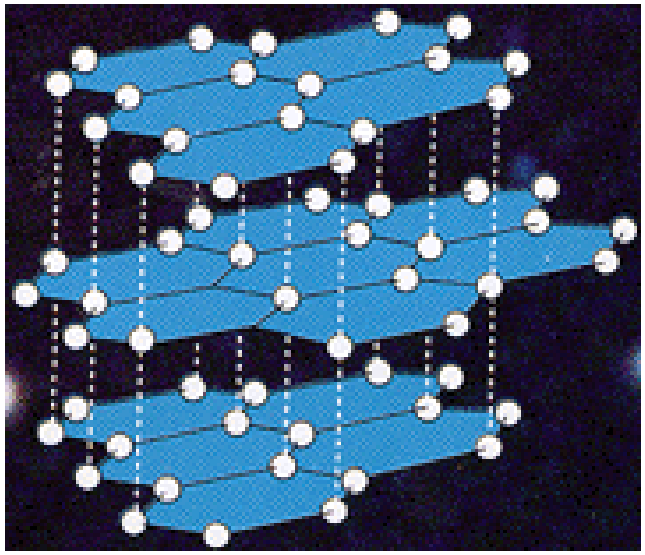


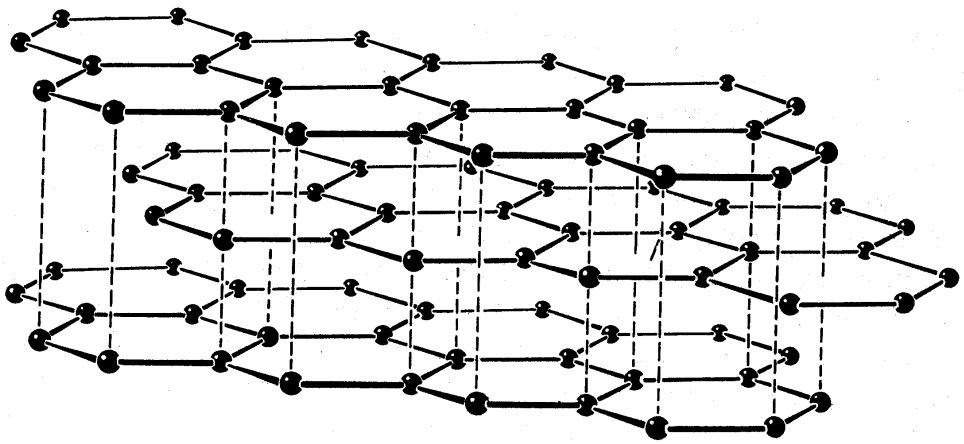



© geology.com


Quaker State
Superior Engine Protection
Super Blend
SAE 10W-30
MOTOR OIL
graphite lubricant

Graphite





- Soft and black and the stable,common,form of carbon.
- Very light and resistant
- Strong bonds within layers and weak bond between layers
- Good conductor of electricity

Graphite

Diamond