

(Structure and bonding in carbon (diamond, graphite, graphene, fullerenes, nanotubes))

Q1. (2018)

each carbon / atom forms 3
(covalent) bonds

one electron per carbon / atom
is delocalised

(so) these electrons carry
charge through the graphite

or

(so) these electrons move
through the structure

Q2. (2019)

contain delocalised electrons

(so) electrons can move through
the structure / nanotube

Q3. (2021)

spherical

Q4. (2021)

any **one** from:

- drug delivery (round the body)
- hydrogen storage
- anti-oxidants
- reduction of bacterial growth
- catalysts
- (cylindrical fullerenes for)
strengthening materials
- (spherical fullerenes for)
lubricants

Q5. (2021)

- bonds are covalent
- giant / macromolecular structure
- three (covalent) bonds per carbon atom
 - or
 - only three electrons per carbon atom used in (covalent) bonds
- so one electron per carbon atom (is delocalised)
- these delocalised electrons
- can move through the structure
- carrying (electrical) charge
- so graphite conducts electricity
- layered structure
- of (interlocking) hexagonal rings
- with weak (intermolecular) forces between layers
 - or
 - no (covalent) bonds between layers
- so the layers can slide over each other
- so graphite is soft and slippery

Q6. (2022)

giant structure

covalent (bonds)

four bonds per carbon / atom

Q7. (2022)

(covalent) bonds are strong

(and many covalent) bonds
must be broken

(so) a lot of energy is required

Q8. (2022)

fullerene

Q9. (2022)

- (C_{70}) is hollow
- (C_{70}) is unreactive
- (C_{70}) is not toxic
- (C_{70} has) a large surface area to volume ratio