Special Examples of IMFs and Bulk Solids

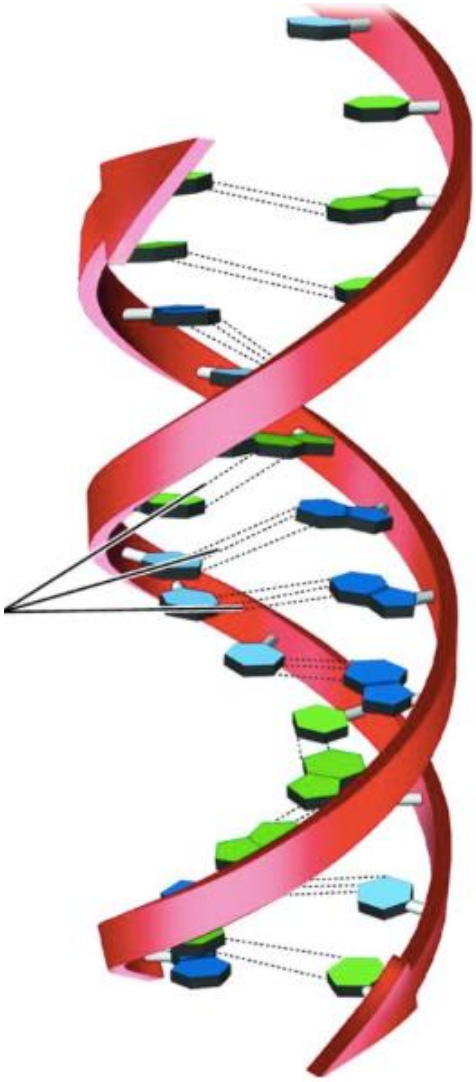
Important Example of H-Bonding

DNA Alpha helix shape-

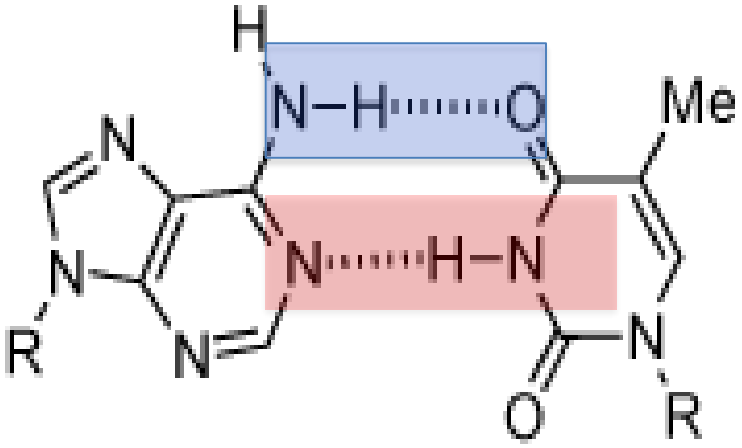
Nucleic acids "bond" A to T and C to G

Generic DNA picture

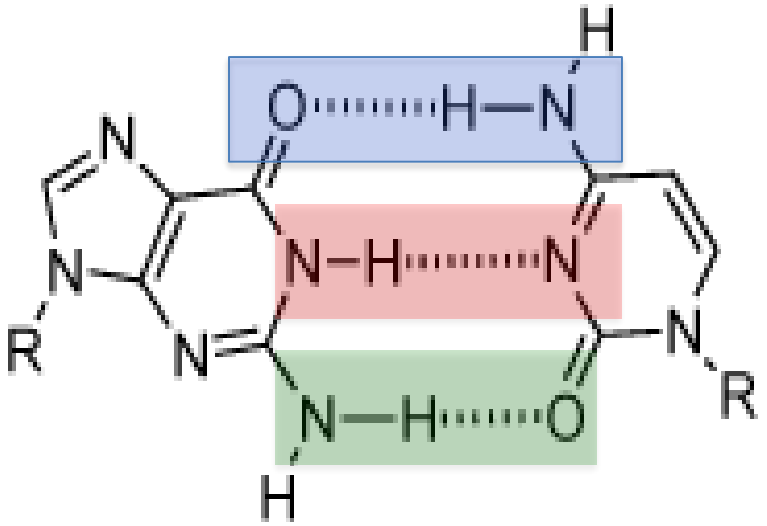
H bonds



Please highlight the Hydrogen Bonds on your little Glue-In paper

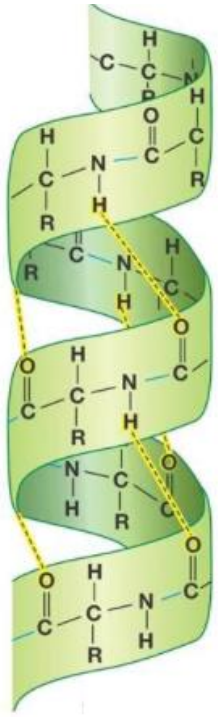


A·T base pair

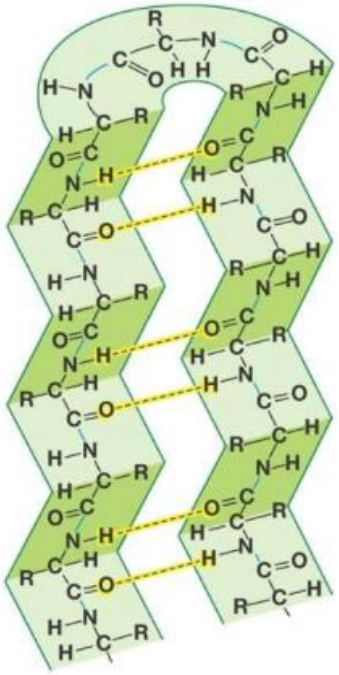


G·C base pair

H bonding in protein shapes



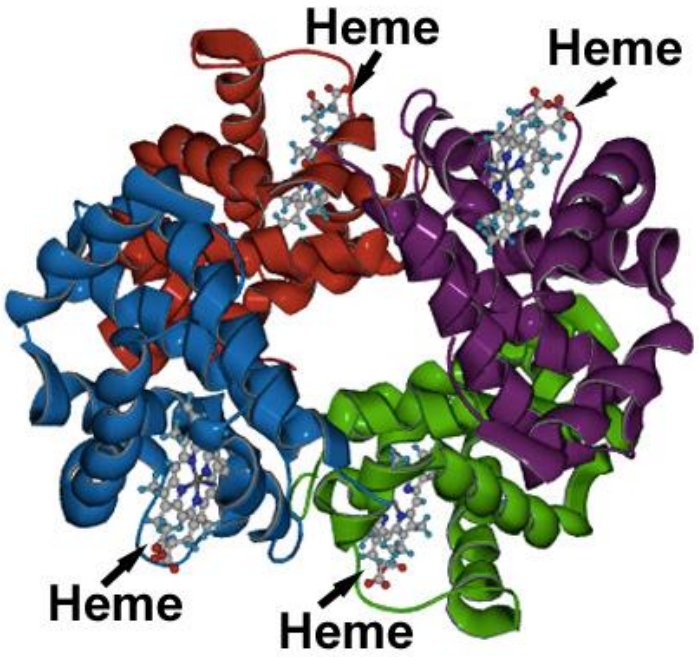
Alpha helix



Beta sheets

Proteins – chain of amino acids

Secondary structures: beta sheets and alpha helix



Hemoglobin protein

Bulk Solids

Interactions in solids

COMBINATION OF:

intramolecular AND intermolecular forces in a "large" or "bulk" scale

3 TYPES

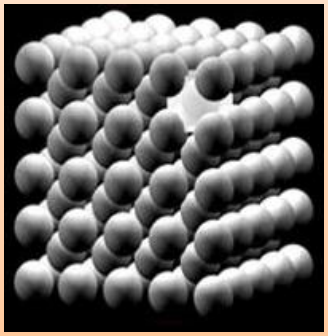
Metallic *(weakest)*
Ionic Lattice *(middle)*
Network covalent *(strongest)*

Bulk solids have very high melting/boiling points because there are SO MANY inter and intra molecular forces holding the atoms close together

METALLIC

Metal ions stack in an ordered fashion held together by the "sea of electrons" and the positive metal ions

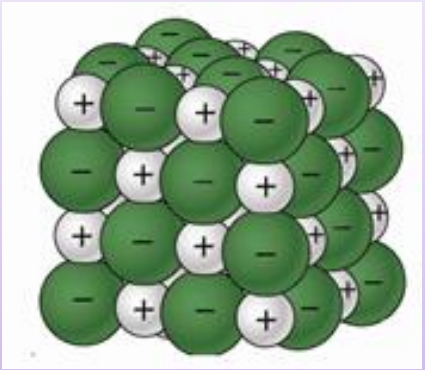
Example: Fe



IONIC LATTICE

ions stack in an ordered fashion to form crystals

Example: NaCl

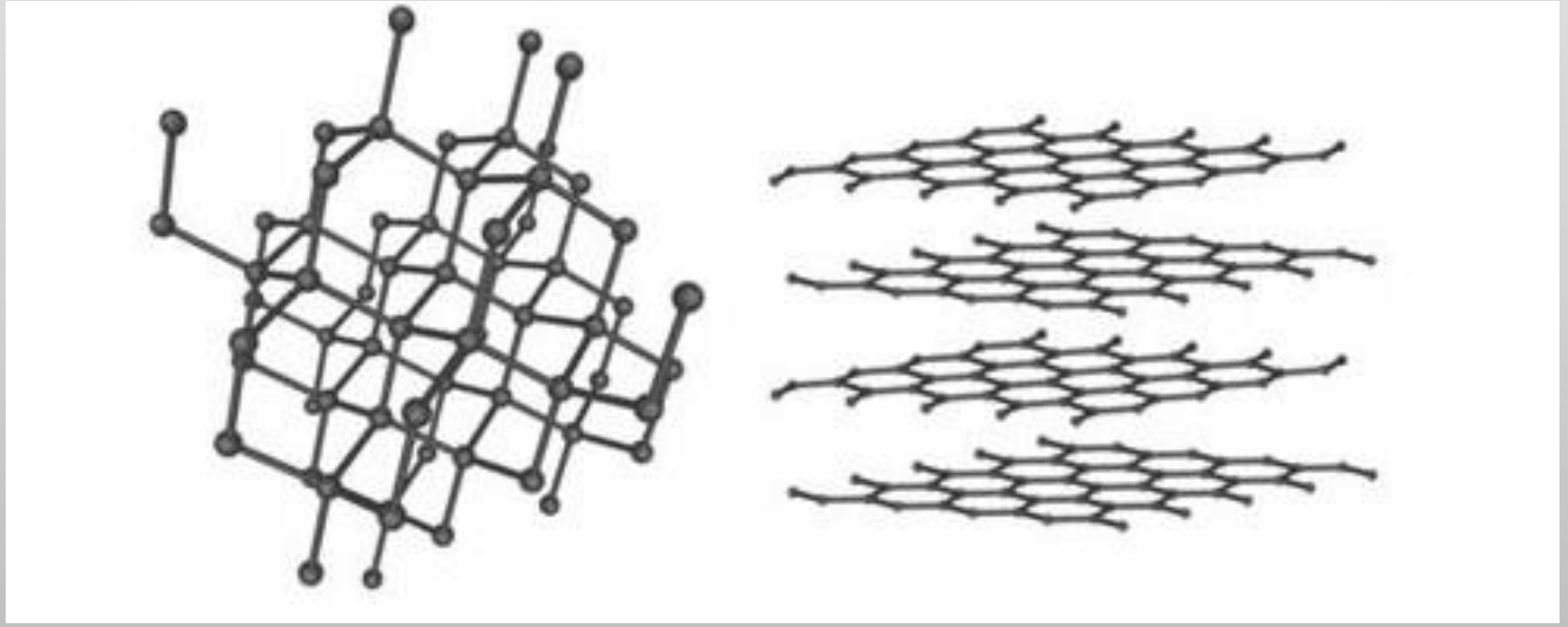


NETWORK COVALENT

Examples: *Diamond/Graphite = both C, Si, SiO_2, W*

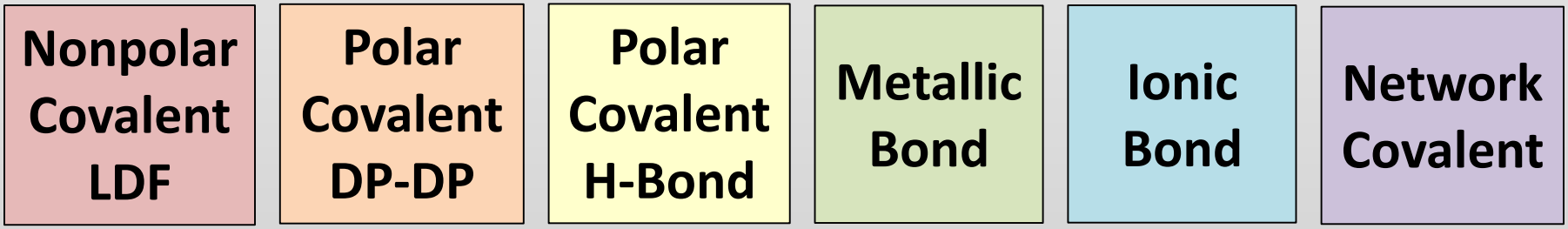
covalently bonded atoms in a continuous network

Example: Carbon



DIAMONDS **GRAPHITE**

Overall Ranking



Weakest
Least
IMFs

Strongest
Most
IMFs

How to Rank Based on Properties

1st – Have to identify the TYPE of IMF present

2nd – Have to put them in order based on the general overall ranking from previous slide

3rd – Don't forget things like:

- **If both are LDF then rank based on largest # of electrons**
- **If both Dipole-dipole then rank based on largest electronegativity difference.**

Example

H_2 - LDF

SiO_2 - Network Covalent

Cu - Metallic

CO - Dipole-Dipole

Br_2 - LDF

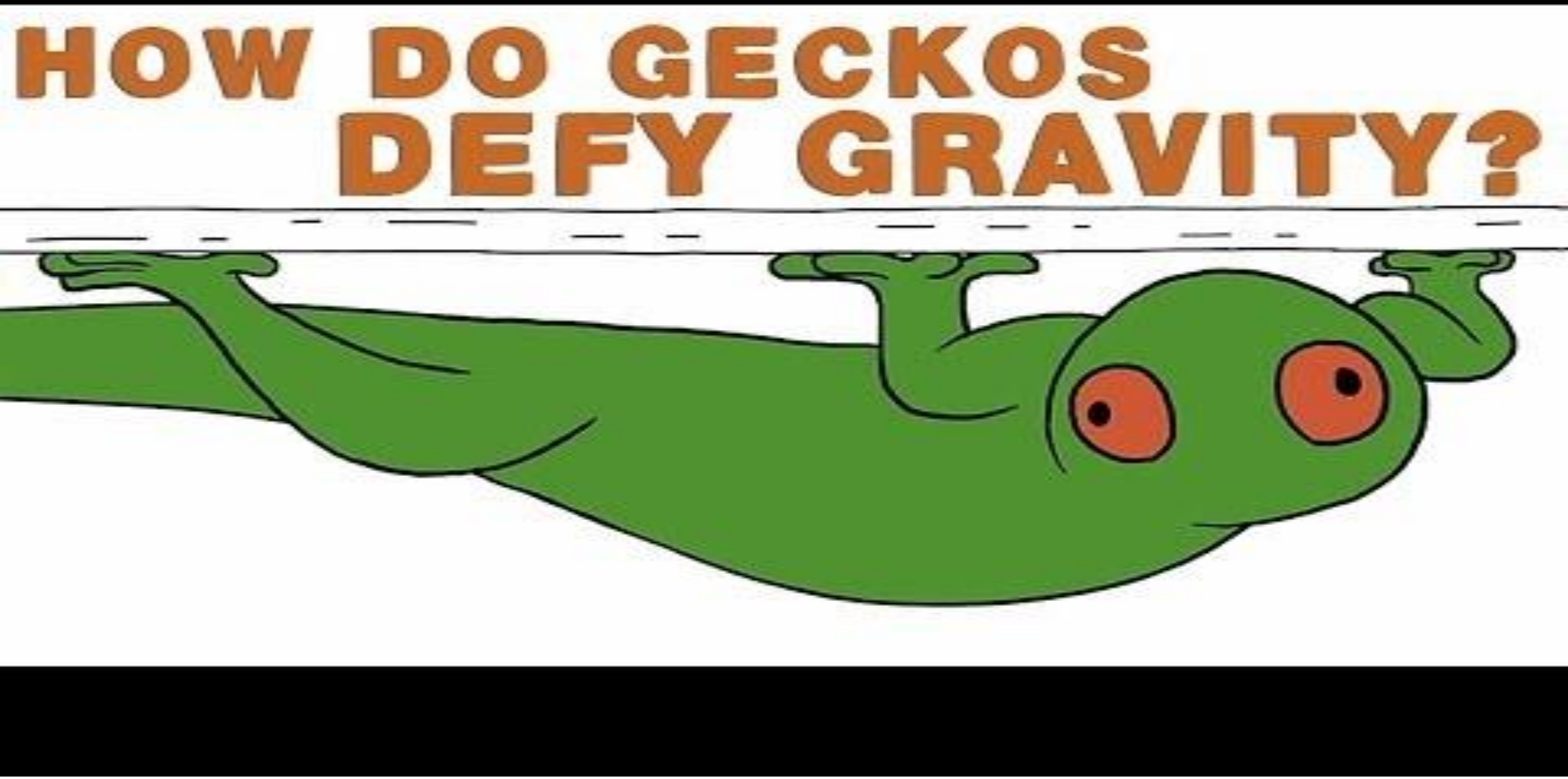
H_2O - Hydrogen bond

KF - Ionic

Rank the following substances from lowest boiling point to highest boiling point

$H_2 < Br_2 < CO < H_2O < Cu < KF < SiO_2$

LOWEST HIGHEST



Geckos

https://www.youtube.com/watch?v=YeSuQm7KfaE

Reading

- It is a class copy – please don't write on the paper directly
- Divide your paper in half so you have a top half for notes and the bottom half for the next part.
- Take notes in your notebook
- Talk about what you are reading in your groups. This will make the next part easier!

Notes from reading
#1
#2
#3

Notes from reading
#1
#2
#3

Pick three examples from your reading.

Write a small paragraph about each one. FULL SENTENCES! It should be several sentences each.

Must fill half the page!

YouTube Link to Presentation

- https://youtu.be/TbugACqGwyI