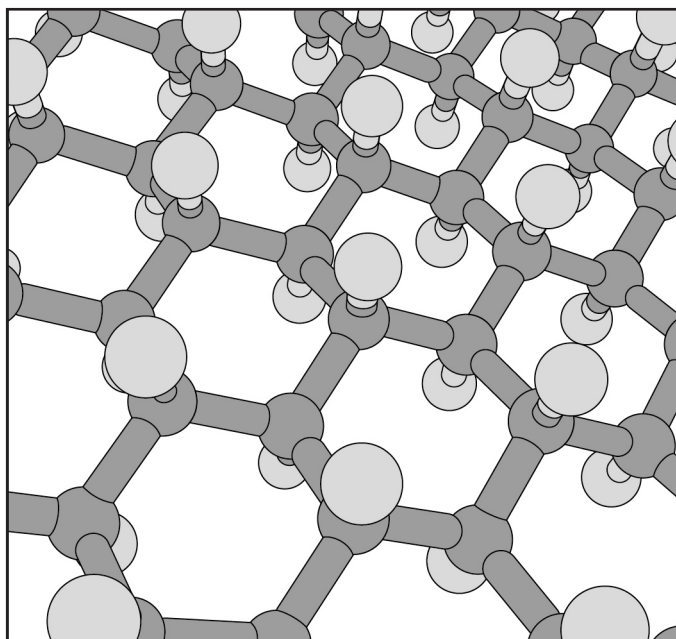


- 3 In 2009 a new material called graphane was discovered. The diagram shows part of a model of the structure of graphane. Each carbon atom is bonded to three other carbon atoms and to one hydrogen atom.



- 3 (a) Deduce the type of crystal structure shown by graphane.

.....  
(1 mark)

- 3 (b) State how two carbon atoms form a carbon–carbon bond in graphane.

.....  
.....  
(1 mark)

- 3 (c) Suggest why graphane does **not** conduct electricity.

.....  
.....  
(1 mark)

- 3 (d) Deduce the empirical formula of graphane.

.....  
(1 mark)





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Question	Marking Guidance	Mark	Comments
3(a)	Giant covalent / giant molecular / macromolecular	1	Not giant alone. Not covalent alone.
3(b)	Shared pair of electrons / one electron from each C atom	1	
3(c)	No delocalised / free / mobile electrons	1	Allow all (outer) electrons involved in (covalent) bonds. Ignore ions.
3(d)	CH	1	Allow HC C and H must be capital letters.