

**5** Which statement explains why sodium and potassium have different melting points?

- A** The attraction between cations and delocalised electrons is stronger in sodium.
- B** The attraction between cations and anions is stronger in sodium.
- C** The attraction between atoms is stronger in sodium.
- D** The attraction between nuclei and shared electron pairs is stronger in sodium.

**6**  $\text{NH}_3$  and  $\text{HCN}$  react together to form  $\text{NH}_4\text{CN}$ , an ionic compound.

Which row states the number of coordinate bonds and the number of  $\pi$  bonds in one formula unit of  $\text{NH}_4\text{CN}$ ?

|          | number of<br>coordinate bonds | number of<br>$\pi$ bonds |
|----------|-------------------------------|--------------------------|
| <b>A</b> | 0                             | 2                        |
| <b>B</b> | 1                             | 2                        |
| <b>C</b> | 0                             | 3                        |
| <b>D</b> | 1                             | 3                        |

**24** When dry ammonia and hydrogen chloride gases are mixed, a solid white ionic compound is formed.

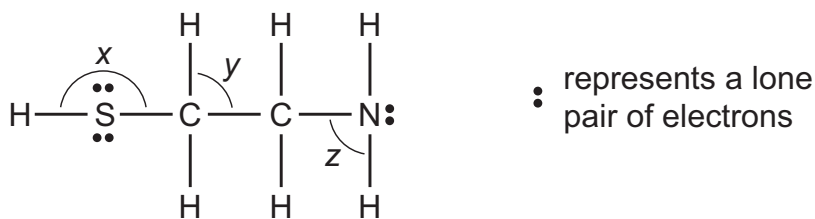
Two statements are listed.

- 1 The formation of the ionic compound is a redox reaction.
- 2 During the formation of the ionic compound, the  $\text{H-N-H}$  bond angle increases.

Which statements are correct?

- A** both 1 and 2
- B** 1 only
- C** 2 only
- D** neither 1 nor 2

- 6 Three bond angles are labelled on the molecule shown.



What is the order of **decreasing** size of the bond angles x, y and z?

|          | largest | → | smallest |
|----------|---------|---|----------|
| <b>A</b> | x       | y | z        |
| <b>B</b> | x       | z | y        |
| <b>C</b> | y       | z | x        |
| <b>D</b> | z       | y | x        |

- 5 In which set do all the molecules have all their atoms arranged in one plane?

- A**  $AlCl_3$ ,  $BF_3$ ,  $PH_3$   
**B**  $AlCl_3$ ,  $CO_2$ ,  $NH_3$   
**C**  $BF_3$ ,  $C_2H_4$ ,  $C_3H_6$   
**D**  $C_2H_4$ ,  $CO_2$ ,  $H_2O$

- 7 The boiling point of water,  $H_2O$ , is higher than that of hydrogen sulfide,  $H_2S$ .

Which statement explains this difference in boiling points?

- A** The bond energy of O–H is greater than the bond energy of S–H.  
**B** The intermolecular forces in  $H_2O$  are weaker than the intermolecular forces in  $H_2S$ .  
**C** The S–H bond in  $H_2S$  is longer than the O–H bond in  $H_2O$ .  
**D** There is significant intermolecular hydrogen bonding in  $H_2O$  but **not** in  $H_2S$ .