

Marks
3

- The molecular orbital energy level diagrams for F_2 and B_2 are shown below. Fill in the valence electrons for each species in its ground state. Hence calculate the bond order for F_2 and B_2 and indicate whether these molecules are paramagnetic or diamagnetic.

| | F_2 | B_2 |
|-----------------------------|---------------------------|---------------------------|
| | | |
| Bond order | $\frac{1}{2} (8 - 6) = 1$ | $\frac{1}{2} (4 - 2) = 1$ |
| Paramagnetic or diamagnetic | diamagnetic | paramagnetic |