

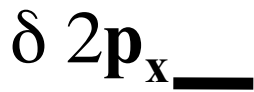
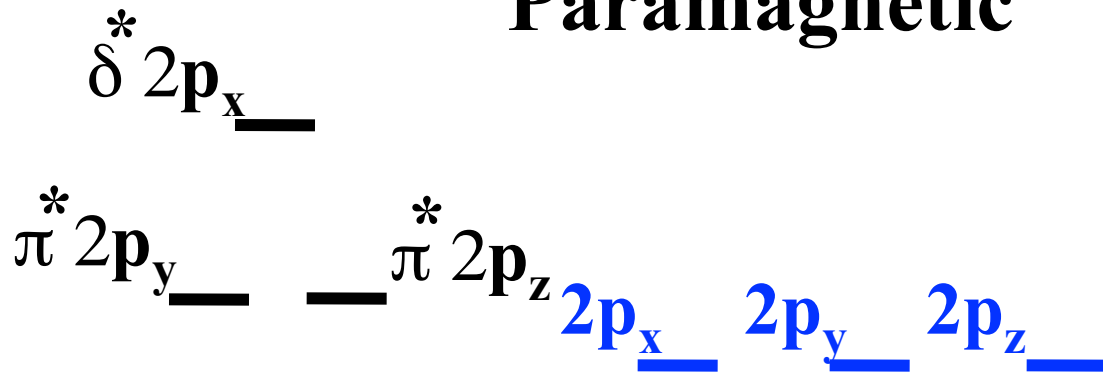
Second-Row MO Diagrams

	Large 2s–2p interaction			Small 2s–2p interaction		
	B ₂	C ₂	N ₂	O ₂	F ₂	Ne ₂
σ_{2p}^*						
π_{2p}^*						
σ_{2p}						
π_{2p}						
σ_{2s}^*						
σ_{2s}						
Bond order	1	2	3	2	1	0
Bond enthalpy (kJ/mol)	290	620	941	495	155	—
Bond length (Å)	1.59	1.31	1.10	1.21	1.43	—
Magnetic behavior	Paramagnetic	Diamagnetic	Diamagnetic	Paramagnetic	Diamagnetic	—

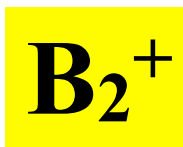
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81 a.

Paramagnetic

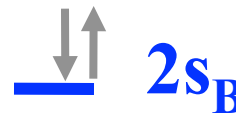
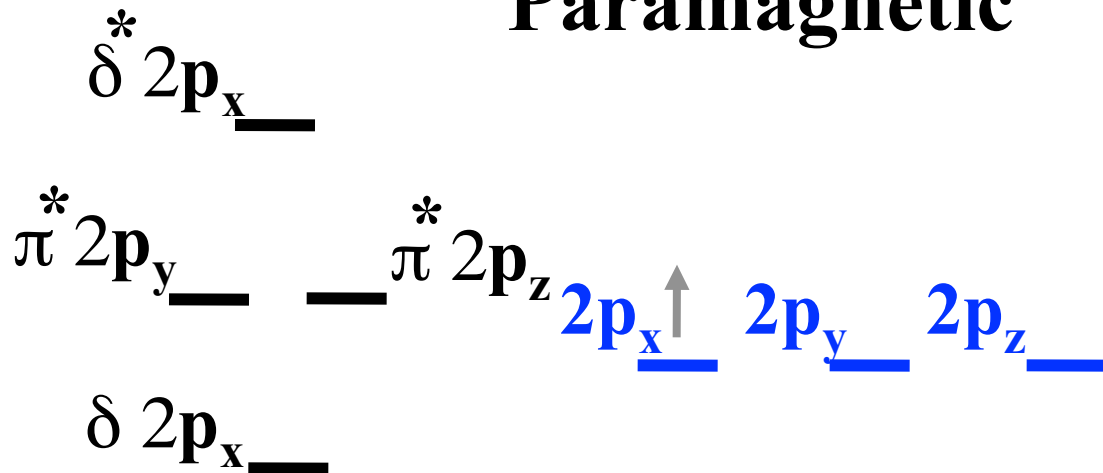


bond order = $\frac{(3 - 2)}{2} = 1/2$
 B_2^+



81 a.

Paramagnetic



bond order = $\frac{(4 - 2)}{2} = 1$
 B_2

B₂

81 b.

Paramagnetic

$2p_x$ $2p_y$ $2p_z$

$\delta^* 2p_x$
 $\pi^* 2p_y$ $\pi^* 2p_z$
 $2p_x$ $2p_y$ $2p_z$
 $\pi 2p_y$ $\pi 2p_z$

$$\text{bond order} = \frac{(1 - 0)}{2} = 1/2$$

Li_2^+

$\delta 2p_x$

$\delta 2s^*$

$2s_A$ ↑

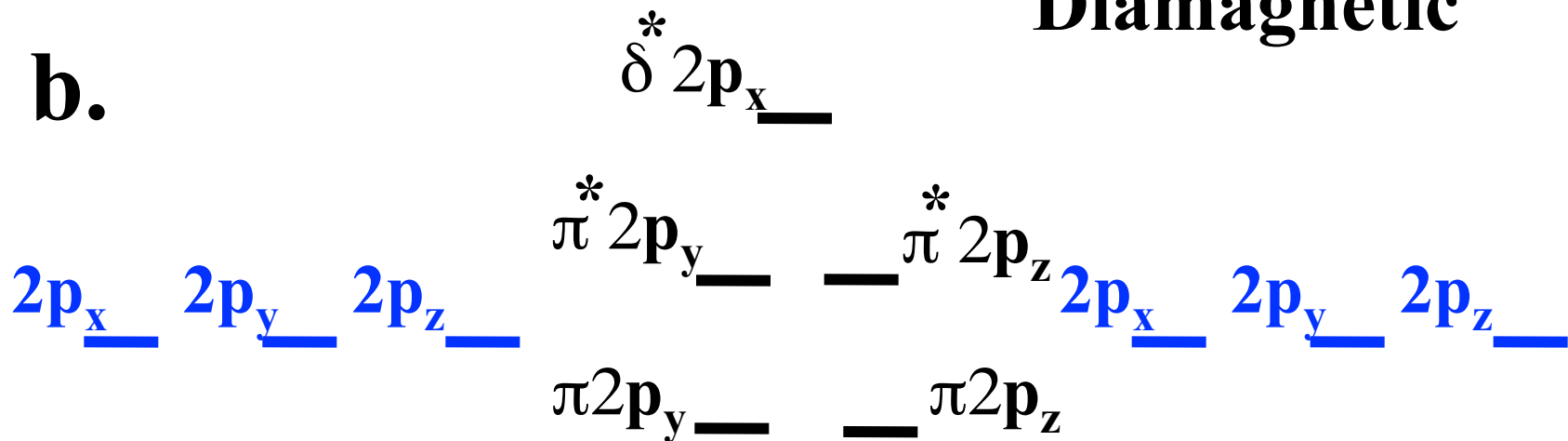
$2s_B$

$\delta 2s$ ↑

Li_2^+

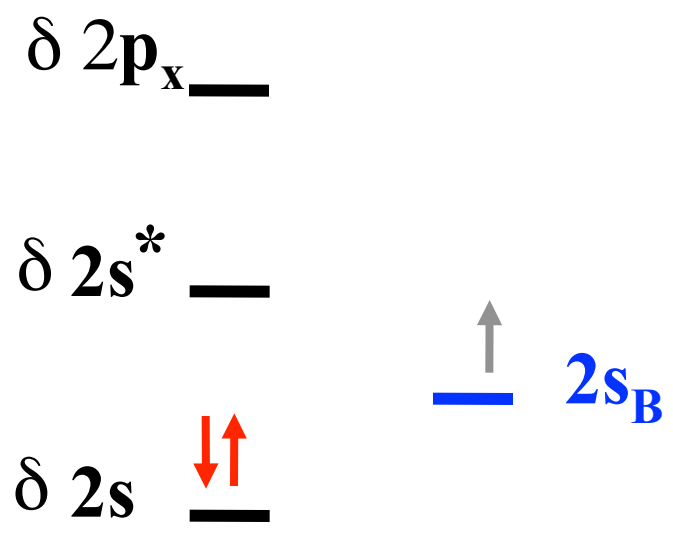
81 b.

Diamagnetic



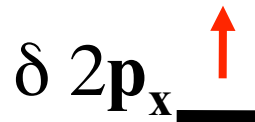
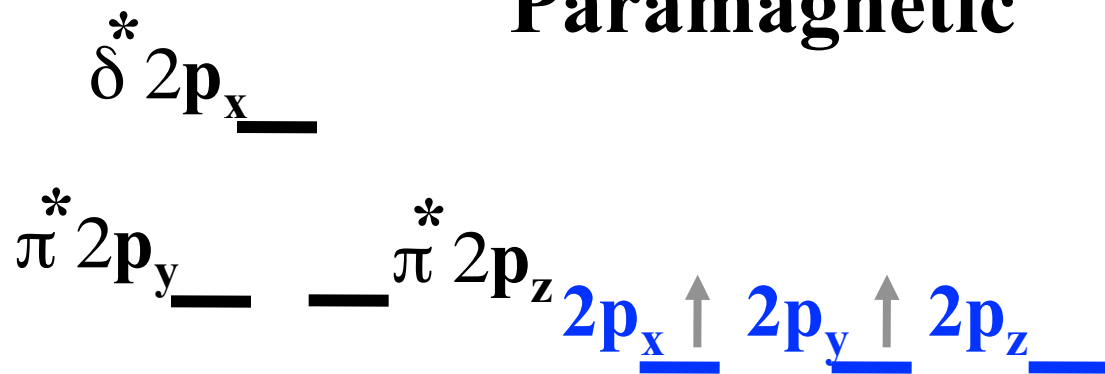
bond order = $\frac{(2 - 0)}{2} = 1$
 Li₂

Li₂

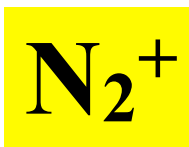
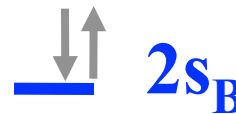


81 c.

Paramagnetic

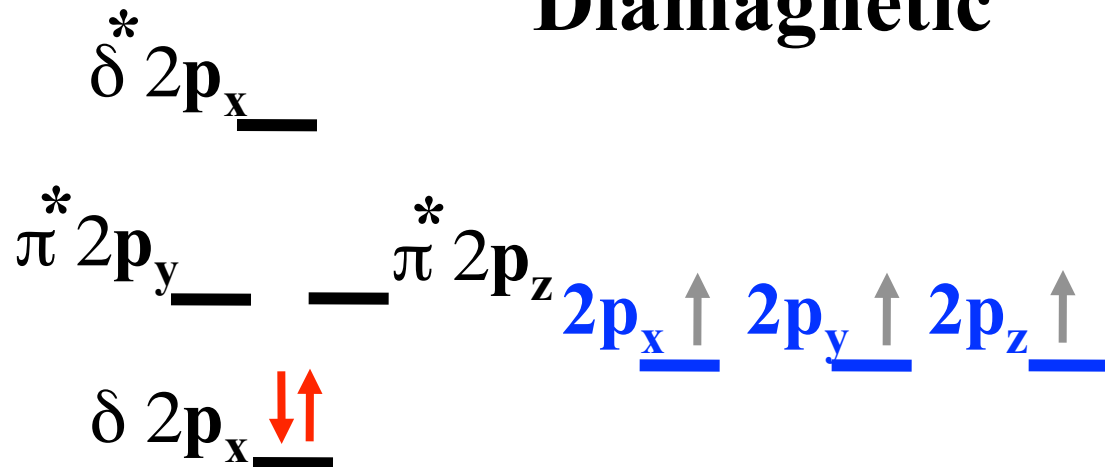


bond order = $\frac{(7 - 2)}{2} = 2.5$
 N_2^+



81 c.

Diamagnetic

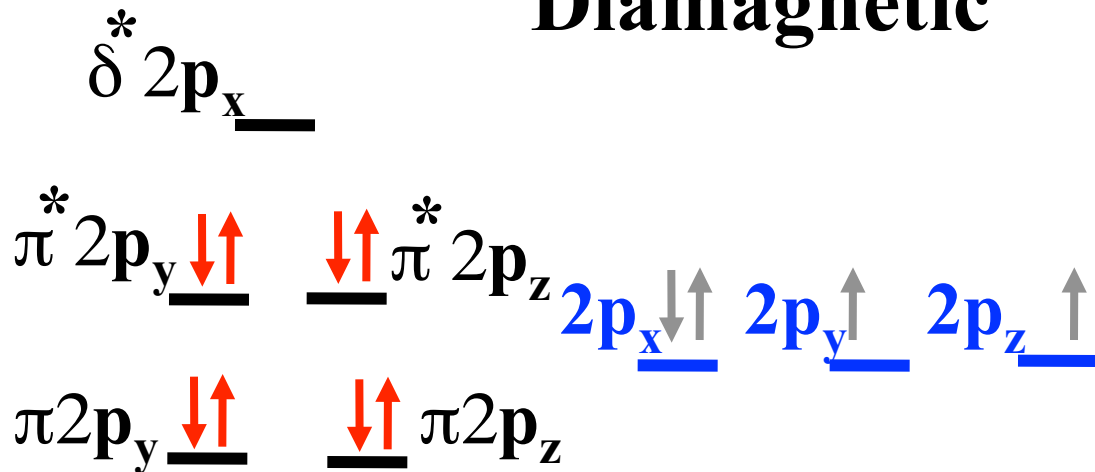
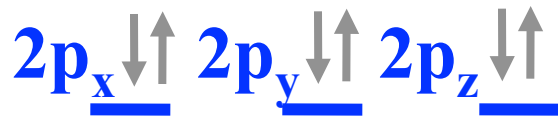


bond order = $\frac{(8 - 2)}{2} = 3$
 N_2

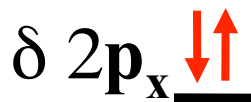


81 d.

Diamagnetic



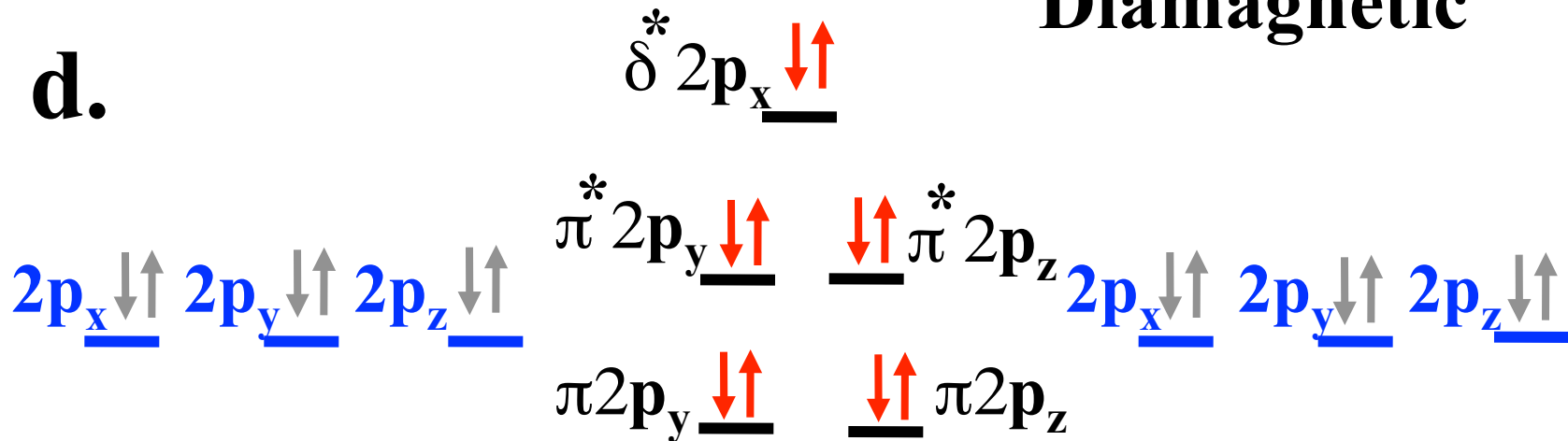
bond order = $\frac{(8 - 6)}{2} = 1$
 Ne_2^{2+}



Ne_2^{2+}

81 d.

Diamagnetic



$$\text{bond order} = \frac{(8 - 8)}{2} = 0$$

Ne₂

Ne₂



