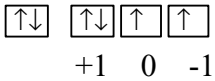
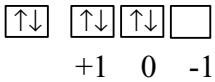
Term Symbols and Molecular Spectroscopy

Atomic Term Symbols - Oxygen

Λ	0	1	2	3
Term	S	P	D	F

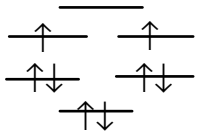
ground state: $(1s)^2\ (2s)^2\ (2p)^4$ 

$\Lambda = +1+1+0\ -1 = 1 \Rightarrow {}^3P$

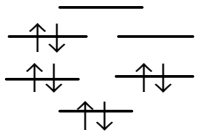
excited state: $(1s)^2\ (2s)^2\ (2p)^4$ 

$\Lambda = +1+1+0\ +0 = 2 \Rightarrow {}^1D$

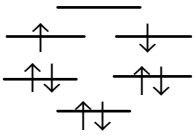
Homonuclear Diatomics* – Oxygen: ground state: KK $(\sigma_{2s})^2(\sigma^*_{2s})^2(\sigma_{2px})^2(\pi_{2py,x})^4(\pi^*_{2px,y})^2$



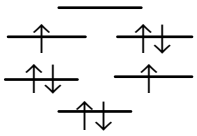
$\Lambda = +1+1-1\ -1\ +1\ -1 = 0$ $\quad {}^3\Sigma_g^-$



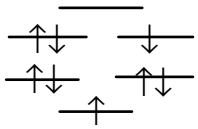
$\Lambda = +1+1-1\ -1\ +1\ +1 = 2$ $\quad {}^1\Delta_g$



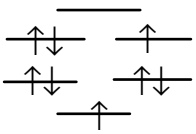
$\Lambda = +1+1-1\ -1\ +1\ -1 = 0$ $\quad {}^1\Sigma_g^+$



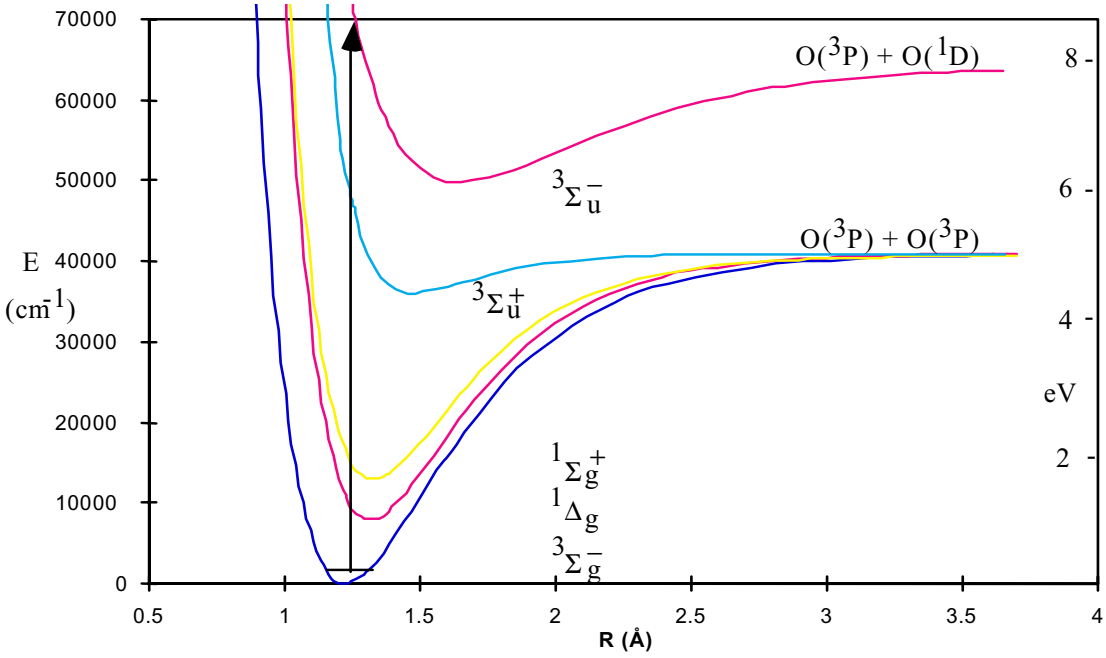
$\Lambda = +1+1-1\ +1\ -1\ -1 = 0$ $\quad {}^3\Sigma_u^-$



?



?



* Configuration diagrams are schematic. No single diagram can represent an open shell system. These diagrams do not take into account electron indistinguishability.