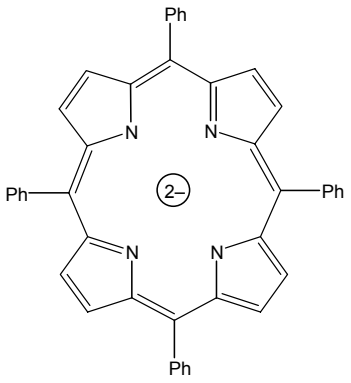
Problem set 7

1. Rationalise the following Mo-Mo bond distances:

$[Mo_2(O_2CMe)_4]$	209 pm
$[Mo_2(SO_4)_4]^{4-}$	211 pm
$[Mo_2Cl_8]^{4-}$	214 pm
$[Mo_2(SO_4)_4]^{3-}$	217 pm
$[Mo_2(HPO_4)_4]^{2-}$	223 pm
$[Mo_2(\mathbf{TPP})_2]$	224 pm



TPP = *meso*-tetraphenylporphyrin

2. The complex $[OsO_2(OH)_4]^{2-}$ has a linear O=Os=O group. Construct a simplified MO diagram for the π-bonding in this complex assuming that O=Os=O lies along the *z*-axis and only the d_{xy}, d_{xz} and d_{yz} orbitals of the metal are involved. Do you expect the complex to be paramagnetic?

[Hint: Figure 8.1 from your Group 8 handout should be useful to you]