Chem 130, Eppley

KEY

In Class 6: Radial Probability Diagrams, etc.

1. Write the electron configuration for:

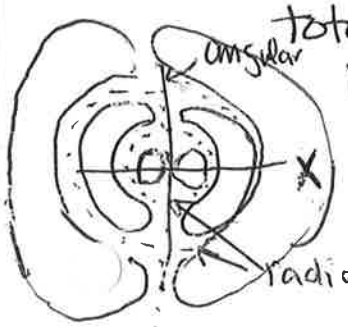
Eu: $[Xe]6s^2 5d^1 4f^6$ — 7 u.e.

W: $[Xe]6s^2 5d^1 4f^{14} 5d^3 = [Xe]6s^2 5d^4 4f^{14}$ 4 u.e.

Are these elements paramagnetic or diamagnetic? Explain briefly.

both are paramagnetic b/c they both have u.e.

2. Draw representation of a $4p_x$ orbital and its radial probability diagram. Label the angular and radial nodes and all of the axes.



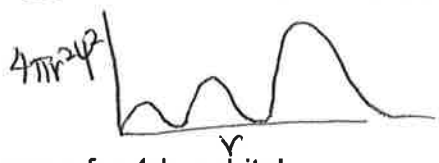
total nodes = l + radial

$n-1$

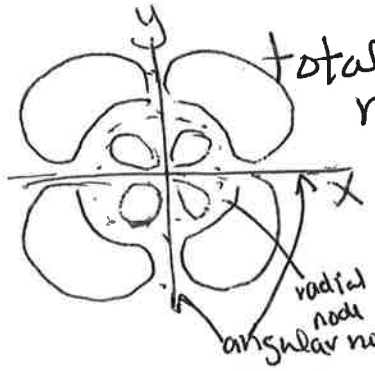
3 = 1 + radial

angular nodes = 1

radial nodes = 2



3. Do the same for $4d_{xy}$ orbital



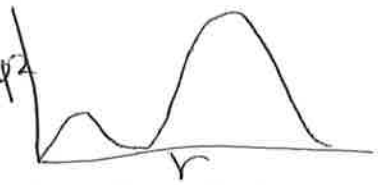
total nodes = l + radial

$n-1$

3 = 2 + radial

angular nodes = 2

radial nodes = 1



next, we'll talk about other exam!

4. Why do you fill the 3s orbital of Mg instead of the 3p orbital?

~~we'll talk about after exam!~~

The 3s orbital is lower in energy than the 3p orbital because it experiences less shielding from inner e^- and spends more time closer to the nucleus as shown in the radial probability diagram →