Lecture 20 Summary

We discussed the structure of the periodic table based on the concept of electrons filling Hydrogenic 'orbitals' as the nuclear charge is increased. The electrons fill these orbitals in the order of increasing n that we would expect from the solution of the hydrogen atom. At some point (namely Ar→K) the order is altered, and a state with larger n but smaller ℓ is favored over one with smaller n but larger ℓ. The reason for this is the fact that smaller ℓ classical orbits involve the electron spending more time inside the screening cloud surrounding the nucleus. This is the same effect mentioned in the last lecture, and becomes increasingly important for atoms of larger nuclear charge.