

Describe the periodic trends exhibited by atomic radii. Justify these trends in terms of principal quantum number, n , and effective nuclear charge, Z_{eff} .

Marks
2

Atomic radius decreases across a period as the number of protons and electrons is increasing. As the electrons are all be added to the same shell, they do not shield each other from the increasing nuclear charge and consequently Z_{eff} increases and the electrons are pulled closer to the nucleus.

Atomic radii increase going down a group. As n increases, the size of the orbitals increases and the electrons in these orbitals are shielded from the nuclear charge by electrons with smaller n . They are thus less tightly held and further from the nucleus.