

Question 3. The simple Bohr model cannot be directly applied to calculate the energy levels of an atom with many electrons. This is because

- (a) of the electrons not being subject to a central force
- (b) of the electrons colliding with each other
- (c) of screening effects
- (d) the force between the nucleus and an electron will no longer be given by Coulomb's law

**Solution:** (a) The simple Bohr model cannot be directly applied to calculate the energy levels of an atom with many electrons because when we derive the formula for radius/energy levels etc, we make the assumption that centripetal force is provided only by electrostatic force of attraction by the nucleus. Hence, this will only work for single electron atoms. In multi-electron atoms, there will also be repulsion due to other electrons. The simple Bohr model cannot be directly applied to calculate the energy levels of an atom with many electrons.