

O_2 molecule consists of two oxygen atoms. In the molecule, nuclear force between the nuclei of the two atoms

- A. is not important because nuclear forces are short-ranged.
- B. is as important as electrostatic force for binding the two atoms.
- C. cancels the repulsive electrostatic force between the nuclei.
- D. is not important because oxygen nucleus have equal number of neutrons and protons.

Answer:

The answer is the option (a).

Nuclear forces are responsible for keeping the nucleons bound in the nucleus.

These forces come under short-range forces, and the maximum distance of their existence is from 10^{-10} to 10^{-15} m. These are one of the strongest forces present in nature. They bring stability of the nucleus, and they are attractive in nature. They are non-central and does not have any charge dependency.

Due to their strong nature, nuclear forces dominate the force between protons in the nucleus, also known as repulsive Coulomb force. And as the distance increases more than a few femtometres, the nuclear forces reduce to zero between two nucleons.

And in case of O_2 molecule made up of two oxygen atom molecules, the nuclear forces are not accounted as they work within the nucleus so (a) is the correct option.