

## 2.E: Exercises

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### Q.1

One of the more recent experimental methods of studying the nucleus of an atom is to probe the nucleus with very high energy electrons. Calculate the order of magnitude of the energy of an electron when it is bound inside a nucleus with a diameter  $1 \times 10^{-12}$  cm. Compare this value with the order of magnitude of the energy of an electron bound to an atom of diameter  $1 \times 10^{-8}$  cm.

### Q.2

Nuclear particles, protons or neutrons have masses approximately  $2 \times 10^3$  times the mass of an electron. Estimate the average energy of a nuclear particle bound in a nucleus and compare it with the order of magnitude energy for an electron bound to an atom. This result should indicate that chemical changes which involve changes in the electronic energies of the system do not affect the nucleus of an atom.

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