Answer on Question #54190 – Chemistry – General chemistry

Question:

When a hydrogen sample in ground state is bombarded then what potential is required to accelerate electron so that the first Paschen line is emitted?

Answer:

The energy of electronic levels in hydrogen atom is determined by the equation:

E_n=-13.6/n^2, where n – the level number.

The first Paschen line corresponds the transition n=4 to n=3. Thus, the electron should be delivered to n=4 level. The potential required to do this equals:

E = E_4-E_1 = 13.6(1 – 1/16) eV = 12.75 eV