

- 27** According to Bohr's model for the hydrogen atom, the electron at the ground state moves in an orbit of specific radius r with specific tangential velocity v around a positively charged nucleus.

Which of the following statements correctly explains why the Bohr's model is wrong?

- A** Bohr's model implies that the uncertainties in r and v are both zero simultaneously and thus violating the Heisenberg uncertainty principle.
- B** Bohr's model implies that the uncertainty in r and the uncertainty in the momentum of the electron in the radial direction are both zero simultaneously and thus violating the Heisenberg uncertainty principle.
- C** Based on the Heisenberg uncertainty principle, an electron confined to such a small space will be moving faster than the speed of light.
- D** Based on the Heisenberg uncertainty principle, the electron will eventually escape, and the atom will not be stable.

- 28** An X-ray spectrum is shown in the figure below.