7   Phosphorus-32 is a radioactive isotope with a half-life of 14.3 days. It emits $\beta$ radiation and does **not** emit $\gamma$ radiation.

(a)  Calculate the activity of a sample of 3.0 µg of phosphorus-32.

activity = .................................................. Bq  [3]

(b)  The energy released in the decay of one nucleus of phosphorus-32 is 1.71 MeV. However, when the energies of the $\beta$-particles emitted from a sample of phosphorus-32 are measured, they are found to have a range of values up to a maximum of 1.71 MeV.

Explain this observation.

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[Total: 5]