8 **(a)** The nuclide $^{23}_{12}Mg$ is an isotope of magnesium that undergoes β^+ decay to form a new nuclide X according to the equation

$$^{23}_{12}Mg \rightarrow {}^{\cdots\cdots}_{\cdots\cdots}X + {}^{\cdots\cdots}_{\cdots\cdots}\beta^+ + {}^{0}_{0}\nu.$$

Four numbers are missing from the equation.

(i) For the nuclide $^{23}_{12}Mg$, state what is represented by the numbers 23 and 12.

23 represents: .....

12 represents: .....
[2]

(ii) Complete the equation by inserting the missing numbers. [2]

(iii) State the name of the group (class) of fundamental particles to which the positron and neutrino belong.

..... [1]

(b) A radioactive source emits particles from its nuclei when it decays.
Fig. 8.1 shows, for the source, the variation with kinetic energy of the number of particles emitted.

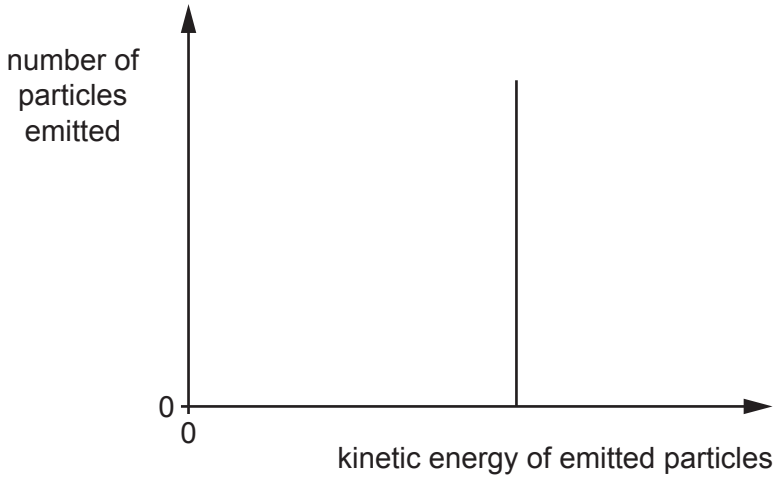

Fig. 8.1

State how Fig. 8.1 shows that these nuclei do **not** undergo beta-decay.

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