15 A nucleus of polonium-210 decays to lead-206 by emitting an alpha particle.
The masses of the particles are shown in the table.

	Mass / kg
Polonium-210	3.48572×10^{-25}
Lead-206	3.41918×10^{-25}
Alpha particle	6.64437×10^{-27}

(a) (i) Show that the energy released in the decay is about 9×10^{-13} J.

(3)

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(ii) 98% of the energy from the decay is released as kinetic energy of the alpha particle.

Calculate the velocity of the alpha particle immediately after the decay.

(2)

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Velocity of alpha particle = ...

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(b) Explain why not all of the energy from the decay is released as kinetic energy of the alpha particle.

(2)

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(Total for Question 15 = 7 marks)