

Solutions Ch 3.4

Answer 1

Year 11

(3 marks)

Airships, blimps, scientific balloons and party balloons are usually inflated with helium. However, someone thinks that helium, ${}^4_2\text{He}$, being a product of radioactive decay, is unsafe. Explain, with reference to the ionisation of atoms, the relative safety of helium.

Description	Marks
Helium (atom/gas) is safe,	1
but He nuclei (alpha particles) are not. On Earth, helium is primarily a product of the radioactive decay of much heavier elements, which emit helium nuclei called alpha particles. (May say He is an ionising particle – acceptable.)	1
Alpha particles, not helium atoms, (slow down and capture 2 electrons, and become helium atoms) ionise atoms during collisions.	1
	Total 3