

2021 Ph H1 Q16

Section: Particles and Waves

Topic: Nuclear Reactions

Question Summary

Decay chain: $^{231}_{90}\text{Th} \rightarrow \beta^- \rightarrow ^{231}_{91}\text{Pa} \rightarrow \alpha \rightarrow ^{227}_{89}\text{Ac}$. Find P, Q, R, S.

Worked Solution

β^- : A same, $Z + 1 \rightarrow P = 231, Q = 91$.

Then α : $A - 4, Z - 2 \rightarrow R = 227, S = 89$.

Final Answer

B — $P = 231, Q = 91, R = 227, S = 89$

Revision Tips

- Apply each decay step in sequence.
- β^- : A unchanged, $Z + 1$.
- α : $A - 4, Z - 2$.
- Check both A and Z each time.