

Chemistry

Section I – Part B (continued)

Marks

Question 19 (5 marks)

- (a) Describe the conditions under which a nucleus is unstable.

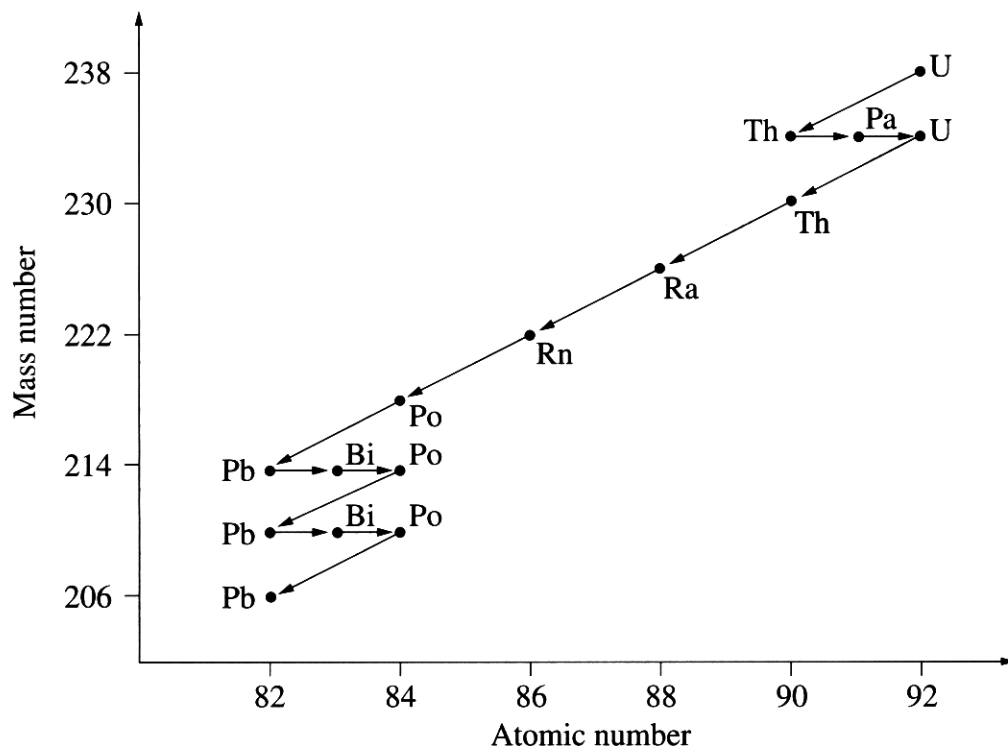
2

A nucleus is unstable when the ratio of neutrons to protons is not correct. If there are more neutrons than protons, and the nucleus is also unstable if the nucleus is too heavy. Thus too many protons and neutrons. Thus they have to lose mass and the nucleus is unstable as it releases protons + neutrons.

Question 19 continues on page 14

Question 19 (continued)

- (b) The following is a flow diagram showing the sequence of products released during the decay of uranium. 3



Use examples from the flow diagram to describe processes by which an unstable isotope undergoes radioactive decay.

H^4_2 to loose mass
 An unstable isotope under goes Alpha decay when the nucleus is too heavy. $^{238}_{92}U \rightarrow ^{234}_{90}Th + ^4_2He$
 and beta e^- decay when the ratio of protons to neutrons are wrong. $^{234}_{90}Th \rightarrow ^{234}_{91}Pa + e^-$
 - to increase protons in ratio of neutrons

End of Question 19