

Topic C.7B Uranium Enrichment

Past Exam Questions (Paper 3)

1. [3 marks]

Modern electric cars store their energy in lithium ion batteries.

The carbon footprint of electric cars depends on how the electricity is produced. Nuclear fission of ^{235}U is one source of electrical energy that has a minimal carbon footprint.

Explain how the proportion of ^{235}U in natural uranium is increased.

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2a. [2 marks]

^{235}U atoms can be used in nuclear reactors whereas ^{238}U cannot. A centrifuge is used to separate isotopes.

Calculate the relative rate of effusion of $^{235}\text{UF}_6(\text{g})$ to $^{238}\text{UF}_6(\text{g})$ using sections 1 and 6 of the data booklet.

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2b. *[3 marks]*

Explain, based on molecular structure and bonding, why diffusion or centrifuging can be used for enrichment of UF_6 but not UO_2 .

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