

Unit 11 - Week 9:Nuclear Fusion

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Assessment 9

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-04-01, 23:59 IST.

1) Geib-Spevack process employs isotopic exchange between which two compounds for the extraction of deuterium? 1 point

- H₂O & HCl
- H₂O & H₂S
- H₂O & NH₃
- H₂O & NaOH

No, the answer is incorrect.
Score: 0

Accepted Answers:
H₂O & H₂S

2) Among the following fusion reactions involving hydrogen, which on releases the largest amount of energy for a single reaction? 1 point

- ${}^2_1H + {}^2_1H \rightarrow {}^3_1H + {}^1_1H$
- ${}^2_1H + {}^2_1H \rightarrow {}^3_2He + {}^1_0n$
- ${}^2_1H + {}^3_1H \rightarrow {}^4_2He + {}^1_0n$
- ${}^2_1H + {}^3_2He \rightarrow {}^4_2He + {}^1_1H$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 ${}^2_1H + {}^3_2He \rightarrow {}^4_2He + {}^1_1H$

3) Among the 4 possible fusion reactions involving hydrogen, D-T reaction is the most common one because of the 1 point

- weakest Coulomb barrier during their interaction.
- smallest difference in mass between the two isotopes.
- endothermic nature of the reaction.
- identical chemical properties of the two isotopes.

No, the answer is incorrect.
Score: 0

Accepted Answers:
weakest Coulomb barrier during their interaction.

4) Tritium has a short half-life of about 12.3 years. Its radioactive decay commonly releases 1 point

- electron
- proton
- positron
- neutron

No, the answer is incorrect.
Score: 0

Accepted Answers:
electron

5) Which among the following reactions facilitating tritium production is endothermic in nature? 1 point

- ${}^6_3Li + {}^1_0n \rightarrow {}^4_2He + {}^3_1H$
- ${}^7_3Li + {}^1_0n \rightarrow {}^4_2He + {}^3_1H + {}^1_0n$
- ${}^2_1H + {}^1_0n \rightarrow {}^3_1H$
- ${}^{10}_5B + {}^1_0n \rightarrow 2{}^4_2He + {}^3_1H$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 ${}^7_3Li + {}^1_0n \rightarrow {}^4_2He + {}^3_1H + {}^1_0n$

6) The triple-alpha fusion process is associated with the appearance of 1 point

- helium
- oxygen
- carbon
- nitrogen

No, the answer is incorrect.
Score: 0

Accepted Answers:
carbon

7) In order to attain the critical ignition temperature for a D-D fusion reaction, the value of Lawson's parameter must be 1 point

- lesser than 10¹⁴ s/cm³
- greater than 10¹⁴ s/cm³
- lesser than 10¹⁶ s/cm³
- greater than 10¹⁶ s/cm³

No, the answer is incorrect.
Score: 0

Accepted Answers:
greater than 10¹⁶ s/cm³

8) Plasma typically refers to ionised gas. It differs significantly from common gases in terms of 1 point

- electrical conductivity
- velocity distribution
- nature of interaction with surrounding
- all of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
all of the above

9) Hydrogen deuteride refers to 1 point

- H₂D
- HD₂
- HD
- HDO

No, the answer is incorrect.
Score: 0

Accepted Answers:
HD

10) Gravitational confinement is possible only in gigantic stars because of the requirement of 1 point

- large magnetic field
- high ion concentration
- large gravitational force
- large temperature

No, the answer is incorrect.
Score: 0

Accepted Answers:
large gravitational force

11) Coulomb barrier refers to the energy barrier created by the _____ force, which the kinetic energy must overcome, so that two nuclei can come close.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) electrostatic
(Type: String) electro-static

1 point

12) In order to maintain a continuous form of the wave function associated with the particle approaching the Coulomb barrier, the particle must satisfy _____ equation on reaching the barrier.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) Schrodinger
(Type: String) Schrodinger equation

1 point

13) The process of producing sequentially heavier isotopes, starting with the sub-atomic particles, is known as _____.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) nucleosynthesis

1 point

14) The probability of fusion reaction occurrence as a function of the _____ of the two reacting nuclei is known as reaction cross-section.

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) relative velocity

1 point

15) Lawson's criterion is related to the product of ion density and _____.

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) confinement time

1 point