

ASSIGNMENT 20

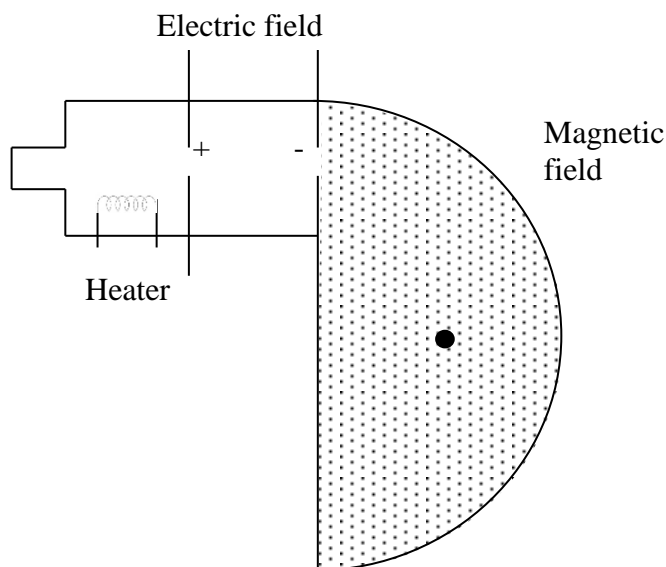
10
Marks
Total

Unit D Assessment

This assignment has **one** question and is worth 10 marks. Note: The answer areas will expand to fit the length of your response. Important: Complete this assignment after you have reviewed your marked Assignment 19.

1. Isotopes can be separated using a mass spectrometer. The mass spectrometer will typically ionize a neutral sample by heating. These ions will then be accelerated through an electric field and then they would enter a magnetic field where they would travel in a circular path. The radius of the path would depend on the mass of the particle and different isotopes in a sample could be identified by their masses.

- (1)
- a. A singly charged lithium ion is accelerated from rest through a potential difference of 4.00×10^4 V. This ion then enters a perpendicular magnetic field with a strength of 0.700 T. Indicate the force(s) acting on the electron in the diagram below.



(4)

b. If the radius of the deflected ion is 0.109 m, what is the mass of the particle?

Answer:

(4)

c. State which physics principles were used to solve for the mass of the particle and why you chose those principles.

Answer:

(1)

d. Determine which isotope of Lithium the ion is. (Hint: determine the atomic mass number)

Answer:

When you have completed the question in this assignment, submit your work.