



Instrumentation & Chromatography
Chemistry Past Exam Questions
Higher Level

2009

Section B - Question 10 C

- (c) In 1922, Francis Aston, pictured right, was awarded the Nobel Prize in chemistry for detecting the existence of isotopes using the first mass spectrometer.
- (i) What are isotopes? (7)
 - (ii) What is the principle of the mass spectrometer? (9)
 - (iii) Calculate, to two decimal places, the relative atomic mass of a sample of neon shown by mass spectrometer to be composed of 90.50% of neon-20 and 9.50% of neon-22. (9)



2008

Section B - Question 2 A & B

2. Chromatography is widely used in chemistry as a separation technique.
- (a) Describe, with the aid of clearly labelled diagrams, how you would set up and carry out an experiment to separate the components in a mixture of indicators using paper chromatography, thin-layer chromatography or column chromatography. (15)
- (b) Explain why the different components of the mixture travel different distances along the paper or along the thin-layer or through the column in a given time. (6)

2006

Section B - Question 10 A

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10. Answer any two of the parts (a), (b) and (c) (2 × 25)
- (a) (i) What are *isotopes*? (4)
- (ii) Define *relative atomic mass*, A_r . (6)
- (iii) What is the principle on which the mass spectrometer is based? (9)
- (iv) Calculate the relative atomic mass of a sample of lithium, given that a mass spectrometer shows that it consists of 7.4 % of ${}^6\text{Li}$ and 92.6 % of ${}^7\text{Li}$. (6)

2005

Section B - Question 10 C

(c) State the principle on which all chromatographic separation techniques are based. (10)

Describe with the aid of clearly labelled diagrams how you could carry out an experiment to separate a mixture of dyes (or indicators) using paper, thin-layer or column chromatography. (15)