Analysis

1. What is chromatography?
2. Give some uses of chromatography.
3. Define mobile phase and stationary phase.
4. What causes different compounds to separate out during chromatography?
5. In TLC what states are the mobile and stationary phases in?
6. In gas chromatography what states are the mobile and stationary phases in?
7. Define adsorption
8. What is the difference between the way a solid stationary phase separates and the way a liquid stationary phase separates?
9. What stationary phase is usually used in TLC?
10. How is the sample prepared for TLC?
11. What is usually drawn at the bottom of the TLC plate?
12. What a TLC plate is placed in the jar containing solvent, where must the solvent level be?
13. Why is the jar sealed during TLC?
14. What causes separation as the solvent rises in TLC?
15. When is the plate taken out of the solvent?
16. What is done to the plate after it is removed from the solvent?
17. Define chromatogram.
18. How are colourless components viewed on a chromatogram?
19. What is an Rf value and how is it calculated?
20. How are Rf values used?
21. What are the limits of TLC analysis?
22. What is gas chromatography (GC) used for?
23. What is the stationary phase in GC?
24. What is the mobile phase in GC?
25. What happens after a mixture is injected into the gas chromatograph?
26. What does the mobile carrier gas do?
27. What happens as the mixture moves through the capillary column and why?
28. What is the gas chromatogram based on?
29. Define retention time and explain how it is used.
30. What are the limitations of GC and how can these be overcome?
31. Why are GC and mass spectrometry (MS) usually used together and what is the process for this?
32. Describe how GC-MS are used in forensics, environmental analysis, airport security and space probes.
33. What are the requirements for NMR spectroscopy?
34. What is a nucleon?
35. Define chemical shift.
36. What is TMS and what is used for?
37. What solvent is used for NMR and why?
38. Why is carbon-13 ideal for NMR spectroscopy?
39. What does chemical shift tell us in C-13 NMR?
40. What is an equivalent carbon?
41. What is the limitation of the chemical shift in C-13 NMR?
42. What do the number of peaks tell us in C-13 NMR?
43. What does the size of the peak tell us in C-13 NMR?
44. Why is Hydrogen-1 ideal for NMR?
45. Why does proton NMR require far less material than C-13 NMR?
46. What do the number of peaks and chemical shift tell us in H-1 NMR?
47. What does the relative peak area tell us in H-1 NMR?
48. What does spin-spin coupling tell us in H-1 NMR?
49. What is the integration trace and what does it tell us?
50. What is the n+1 rule?
51. What is the name of the multiplet if there are no splits?
52. What is the name of the multiplet if there are 2, 3 or 4 splits?
53. What does a triplet-quartet pairing usually indicate?
54. What is the problem with OH and NH in H-1 NMR?
55. What type of splitting pattern is seen in OH and NH and what is the peak usually like?
56. How is the problem of OH and NH peaks overcome?
57. Explain how H-1 NMR is used in diagnostic medicine.
58. What does mass spectrometry tell us and what are its limitations?
59. What does infrared spectroscopy tell us and what are its limitations?