

VCE Chemistry: Unit 3

Worksheet 9 – Mixed Spectroscopy

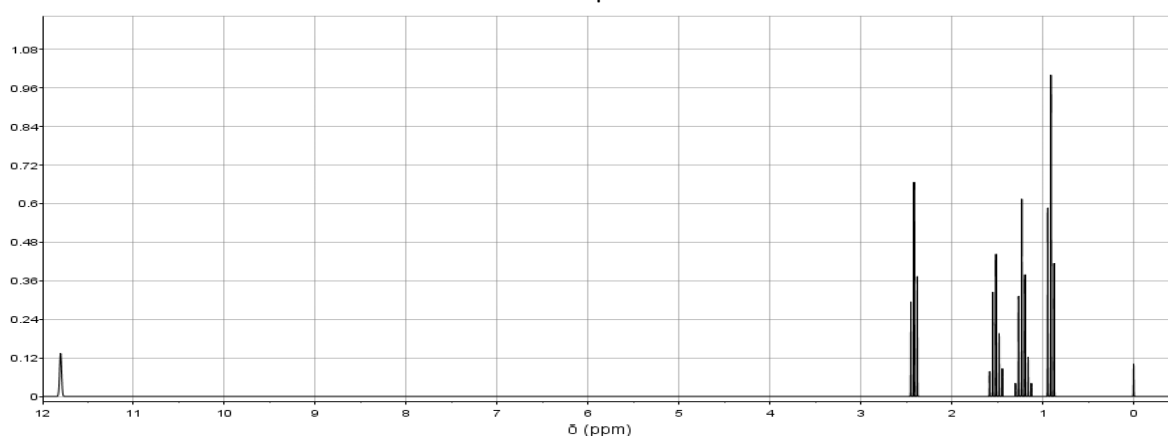
Two organic compounds, A and B were identified using different chemical analysis techniques. Compound A, containing carbon, oxygen and hydrogen, weighed 3.450g and was burned in excess air. This produced 7.44g of carbon dioxide as well as 3.04g of steam. The compound did not bubble when sodium carbonate was added into the test tube.

a) Find the empirical formula of compound A. ___/2 marks

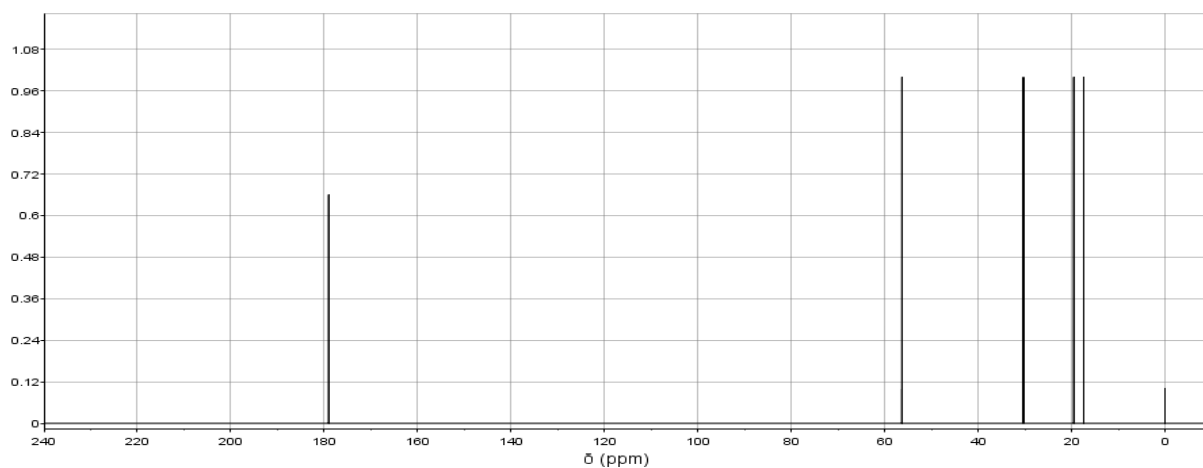
b) If 0.667g of compound A was found to occupy 160.0mL at standard laboratory conditions, find the molecular formula of compound A. Provide the possible systematic name for compound A. ___/ 2 marks

Compound B was also tested with sodium carbonate, and bubbling was observed. The gas formed was found to be carbon dioxide (CO₂). Compound B was analysed using ¹H NMR and also ¹³C NMR. The following spectrums were obtained.

¹H NMR Spectrum



^{13}C NMR Spectrum



c) What does the ^1H NMR tell you about compound B?

d) How many carbons does this molecule have?

e) Identify compound B, giving the systematic name.

Which of the IR spectra show compound A and compound B?

