29 Chromatography and spectroscopy

Specification reference	Checklist questions	
6.3.1 a	Can you interpret one-way TLC chromatograms in terms of *R*f values?	☐
6.3.1 b i	Can you interpret gas chromatograms in terms of retention times?	☐
6.3.1 b ii	Can you interpret gas chromatograms in terms of the amounts and proportions of the components in a mixture?	☐
6.3.1 c i	Can you recall the test for alkenes by reaction with bromine?	☐
6.3.1 c ii	Can you recall the test for haloalkanes by reaction with aqueous silver nitrate in ethanol?	☐
6.3.1 c iii	Can you recall the test for phenols by weak acidity but no reaction with CO_3^{2-}?	☐
6.3.1 c iv	Can you recall the test for carbonyl compounds by reaction with 2,4- DNP	☐
6.3.1 c v	Can you recall the test for aldehydes by reaction with Tollens' reagent?	☐
6.3.1 c vi	Can you recall the test for primary and secondary alcohols and aldehydes by reaction with acidified dichromate?	☐
6.3.1 c vii	Can you recall the test for carboxylic acids by reaction with CO_3^{2-}?	☐
6.3.2 a i	Can you use a carbon-13 NMR to make predictions about the number of carbon environments in a molecule?	☐
6.3.2 a ii	Can you use a carbon-13 NMR to make predictions about the different types of carbon environment present, from chemical shift values?	☐

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Specification reference	Checklist questions	
6.3.2 a iii	Can you use a carbon-13 NMR to make predictions about possible structures for the molecule?	☐
6.3.2 b i	Can you use a high resolution proton NMR spectrum to make predictions about the number of proton environments in the molecule?	☐
6.3.2 b ii	Can you use a high resolution proton NMR spectrum to make predictions about the different types of proton environment present, from chemical shift values?	☐
6.3.2 b iii	Can you use a high resolution proton NMR spectrum to make predictions about the relative numbers of each type of proton present from relative peak areas, using integration traces or ratio numbers, when required?	☐
6.3.2 b iv	Can you use a high resolution proton NMR spectrum to make predictions about the number of non-equivalent protons adjacent to a given proton from the spin– spin splitting pattern, using the $n + 1$ rule?	☐
6.3.2 b v	Can you use a high resolution proton NMR spectrum to make predictions about possible structures for the molecule?	☐
6.3.2 c	Can you predict a carbon-13 or proton NMR spectrum for a given molecule?	☐
6.3.2 d i	Can you describe the use of tetramethylsilane, TMS, as the standard for chemical shift measurements?	☐
6.3.2 d ii	Can you recall the need for deuterated solvents, e.g. $CDCl_3$, when running an NMR spectrum?	☐
6.3.2 d iii	Can you identify O–H and N–H protons by proton exchange using D_2O?	☐
6.3.2 e i	Can you deduce the structures of organic compounds from elemental analysis?	☐
6.3.2 e ii	Can you deduce the structures of organic compounds from mass spectra?	☐

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Specification reference	Checklist questions	
6.3.2 e iii	Can you deduce the structures of organic compounds from IR spectra?	☐
6.3.2 e iv	Can you deduce the structures of organic compounds from NMR spectra?	☐