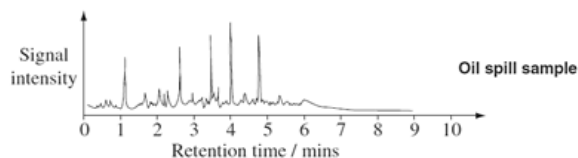
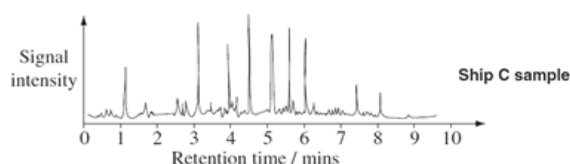
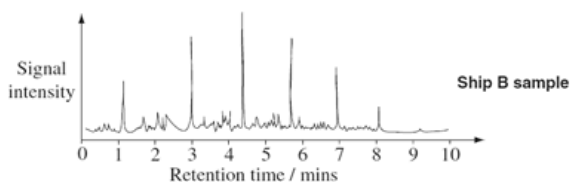
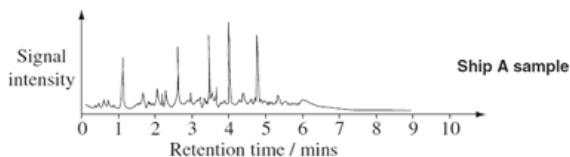


Analytical chemistry (2009 NSW HSC)

1) An oil spill occurred at a shipping port. To determine which ship was responsible, a sample of the oil was collected and analysed by gas chromatography. Samples of bunker oil were collected from three ships in port at the time and analysed by gas chromatography. The chromatograms of the samples collected are shown.



Solution will appear here

(i) By comparing the chromatograms identify whether the oil spill originated from one of these vessels.

Solution

(ii) Explain what the peaks in the chromatograms represent.

Solution

(iii) Describe the features of instrumental chromatography (GLC or HPLC) that allow the analysis of small samples.

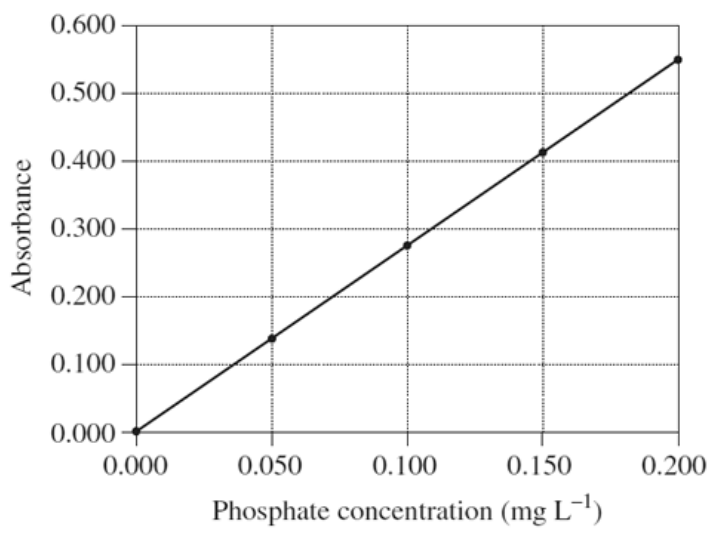
Solution

2) An analytical chemist determined the phosphate concentration of water samples from three local streams.

(a) Using the absorbance values in the table and graph, determine the mean absorbance and mean phosphate concentration for each stream and complete the table.

Solution will appear here

Stream	Absorbances measured	Mean absorbance	Mean phosphate concentration (mg L^{-1})
1	0.090, 0.092, 0.088		
2	0.513, 0.511, 0.514		
3	0.234, 0.237, 0.234		



[Solution](#)

3) The recommended maximum level of phosphate in streams is 0.100 mg L⁻¹.

With reference to the recommended maximum level of phosphate for stream water, explain why there are differences between the three streams.

[Solution](#)