ATAR Chemistry – Unit 1 & 2

Chromatography/ Water Quiz

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Task 13: Section A: Chromatography Notes \_\_\_/6 Test\_\_\_\_\_\_\_\_\_\_\_\_/ 28**

**Part 1: Multiple-choice (answer by neatly writing your response in the column to the right)**

**(4 marks)**

|  |  |
| --- | --- |
| 1. In Thin Layer Chromatography what does the symbol “RF” stand for? |  |
| * 1. Chromatography factor |  |
| * 1. Retardation factor |
| * 1. Retardation frequency |
| * 1. Chromatography frequency |
|  |  |
| 1. High-performance Liquid chromatography is used to separate which of the following? |  |
| * 1. Small organic molecules |  |
| * 1. Small covalent molecules |
| * 1. Large organic molecules |
| * 1. Large ionic molecules |
|  |  |
| 1. In High-performance Liquid chromatography the mobile phase is… |  |
| * 1. Plasma |  |
| * 1. Gas |
| * 1. Liquid |
| * 1. Solid |
|  |  |
| 1. What is the stationary phase in Gas chromatography? |  |
| * 1. A long, thin column. |  |
| * 1. Absorbent paper |
| * 1. A short column |
| * 1. Fine powder on glass or plastic |
|  |  |
|  |  |
|  |  |
|  |  |

**Part 2**

1. In thin film chromatography components of the mixture being analysed are separated. **( 2 marks)**

What 2 processes allow the components to be separated?

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1. Draw a sketch of a thin film chromatography set-up and label it. On your diagram

include the terms solvent, stationary phase, mobile phase, sample, analyte, absorbent material (adsorbent)

*(hint more than one word may be used for each part.)* (**4 marks – 1 for correct diagram, ½ mark per label)**

1. In thin film chromatography Rf is characteristic of the material being analysed and can have a value between 0 and 1. **(2 marks)**

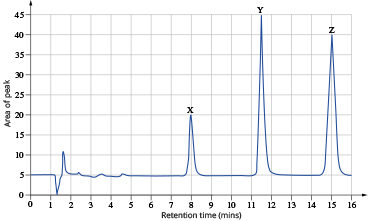
What does it mean when:

Rf = 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Rf = 0: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Question 4 (14 marks)

A sample of pond water was analysed for organic compounds X, Y and Z using an HPLC. The following chromatogram was obtained.



a i Which of the three compounds travelled through the HPLC fastest? State a reason for your answer. (2 marks)

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ii Which compound is present in the largest quantity? State a reason for your choice.

(2 marks)

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The concentration of compound X needs to be determined.

c i Explain why a calibration curve is required to determine the concentration of X. (1 mark)

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ii Describe how you would prepare such a calibration curve. (4 marks)

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d Another sample of water contained half of the concentrations of X and Z but no Y or any other compound. On the set of axes above, sketch the predicted chromatogram for this sample of water. Clearly label the peaks. (3 marks)

1. Describe an application of Gas Chromatography and include the types of molecules in your answer

**[2 marks total]**

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**TASK 17 : Section B : Water Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Notes: \_\_\_\_ /6 Test \_\_\_\_\_\_/ 19 Total: \_\_\_\_\_\_\_\_\_\_\_\_/ 25

**Part 1: Multiple-choice** (answer by neatly writing your response in the column to the right) **[2 marks]**

|  |  |
| --- | --- |
| 1. Why is chlorine added to drinking water? |  |
| 1. To remove heavy metals |  |
| 1. To remove oxygen |
| 1. To kill various pathogens (bacteria, viruses etc) |
| 1. To make it slightly blue in colour. |
|  |  |
| 1. Which of the following elements is attributed to causing soil acidification? |  |
| * 1. Nitrogen |  |
| * 1. Carbon |
| * 1. Chlorine |
| * 1. Fluorine |
|  |  |

**Part 2: Short Answer Questions:**

1. Describe how increased levels of carbon dioxide in the atmosphere can cause acidification of oceans.

**[3 marks total]**

1. Choose a source of drinking water in Western Australia  **[ 5 marks total]**
   1. Describe how the water is collected. [1]

* 1. Describe two steps used to make the water safe to drink/ potable [2]

* 1. Describe any impacts or potential impacts on the environment. [2]

1. Heavy Metal Contamination **[ 5marks total]**

a) Why is it necessary to monitor heavy metals? [ 1 ]

b) Name 2 ways heavy metal contaminants could get into our water supply? [2 ]

c) Choose an industry and describe how they prevent/reduce water contamination? [ 2 ]

1. Soil Acidification: Discuss the causes, effects and remedies. **[4 marks total]**

Cause : (1)

Effect: (2)

Remedy (1)