ATAR Chemistry – Unit 1 & 2

**Research Assignment 4 & 5**

Assessed as one test, worth 2 assessments (half hour each)

*Your research will be assessed as a quiz . You are permitted to bring a maximum of 6 pages of notes for this assessment; however they must be your own notes.*

**Research Assignment 4 : Chromatography**

Data from chromatography techniques can be used to determine the composition and purity of substances; the separation of the components is caused by the variation in strength of the interactions between atoms, molecules or ions in the mobile and stationary phases

*Use the following as a guide to your research:*

* The decision to use a particular chromatographic technique depends on a number of factors, including the properties of the substances being separated, the amount of substance available for analysis and the sensitivity of the equipment.
* Chromatographic techniques have a wide range of analytical and forensic applications, including monitoring air and water pollutants, drug testing of urine and blood samples, and testing for food additives and quality.
* *Useful sources of information are your textbook, internet and video clips (see one suggestion below)*

**Review the following (this was covered in class)**

* What is chromatography?
* Determine how it works and the chemical principles involved? *Use correct chemical terminology such as solvent, solute etc.*
* What is an Rf value and what information does it give?

**Research**

1. **Types of chromatography**. Distinguish between

1. thin layer chromatography (TLC)
2. gas chromatography (GC),
3. high-performance liquid chromatography (HPLC)

and find out the types of molecules and application (s) each is most suitable for .

**2. Quantitative analysis :** Read pg 296 to 298 and ensure you understand how to do the quantitative analysis. Do worked example 13.2.1 and key Questions to help your understanding.

**Research Assignment 5 : Water**

Water is essential to life and the continued fresh supply of clean water is an ongoing issue our community faces. As we move forward into the 21st century not only is the supply of water a concern but also the impact of human activities on all water resources on this planet.

Research the following:

1. **Supply of potable water**

List 3 different sources of drinking water in this state.

For one source, research the following. :

How is the water collected?

What steps are taken to ensure the water is pure?

What chemicals are added to water to keep it clean? *Why are they added?*

What are the environmental impacts of each method of sourcing drinking water?

1. **Heavy Metal Contamination of water**:

How could heavy metals get into our groundwater supply. For example from industrial sources?

How is heavy metal contamination in groundwater monitored?

Choose an industry and find out the steps that our taken to reduce/prevent ground water contamination? Eg, fracking, mining, chemical production

Consider how social and economic factors influence how effective these steps are.

1. **Soil acidification:**

What is soil acidification?

What causes soil acidification?

What is the impact of soil acidification?

How can soil acidification be reversed?

1. **Ocean acidification:**

What is ocean acidification?

How have increased levels of CO2 in the atmosphere caused ocean acidification?  
*Hint: use of chemical equations would be appropriate for this question.*

What are the environmental impacts of ocean acidification?

**Date of Assignment Quiz:** Term 4 : Week 1