

## Chemistry – Chemical analysis – Checklist

### 4.8 Chemical analysis

4.8.1 Purity, formulations and chromatography	Taught	Practice	Mastered
<p>Define the terms:</p> <ul style="list-style-type: none"><li>• pure substance</li><li>• compound.</li></ul> <p>Explain, in terms of intermolecular forces, the terms:</p> <ul style="list-style-type: none"><li>• melting point</li><li>• boiling point.</li></ul> <p>Use data to identify pure and impure substances.</p> <p>Identify the contents of mineral waters sold as 'pure'. Discuss the meaning of 'pure'.</p>			
<p>Define the terms:</p> <ul style="list-style-type: none"><li>• mixture</li><li>• formulation.</li></ul>			
<p>Describe a method for paper chromatography.</p> <p>Explain what happens to substances during the process of chromatography.</p> <p>Describe to another student what the <math>R_f</math> value is and instructions on how to calculate the <math>R_f</math> value.</p> <p>Devise a method for distinguishing between pure and impure substances using chromatography.</p>			

4.8.2 Identification of common gases	Taught	Practiced	Mastered
Describe the test for hydrogen to another student.			
Describe the test for oxygen to another student.			
Describe the test for carbon dioxide to another student.			
Describe the test for chlorine to another student.			

4.8.3 Identification of ions by chemical and spectroscopic means	Taught	Practiced	Mastered
Describe the flame tests for identifying cations to another student.			
Research how firework manufacturers produce the different colours in fireworks.			
Describe how sodium hydroxide can be used to identify some cations to another student.			
Describe how dilute acids can be used to identify carbonates to another student.			
Describe how silver nitrate can be used to identify halides to another student.			
Describe how barium chloride in the presence of dilute hydrochloric acid can be used to identify sulfate ions to another student.			
Plan an analysis programme to identify an unknown substance using just test tube reactions.			
Describe the process of flame emission spectroscopy.			
Explain what happens to a sample throughout the process of flame emission spectroscopy.			
Interpret instrumental results for flame emission spectroscopy.			
Research how chemical analysis has been used to detect and solve crimes especially in forgery and murder by poisoning.			
Research how robotic spacecraft sent to investigate other planets analyse their atmospheres and surface materials using instrumentation.			
Discuss the advantages and disadvantages of instrumental analysis versus test tube analysis.			