

CHEMISTRY CHO2O31Y1C

TOPIC RESOURCE INFORMATION

ACHIEVEMENT STANDARD 91163 (VERSION 2) CHEMISTRY 2.3

Demonstrate understanding of the chemistry used in the development of a current technology

Level 2, Internal assessment

3 credits

C. SOAPS AND MODERN DETERGENTS

Achievement	Achievement with Merit	Achievement with Excellence
<p>The student submits a report that:</p> <ul style="list-style-type: none"> • Describes two purposes of soap/detergents • Describes a timeline with key developments in soap manufacture. • Describes what a soap and modern detergents are. • Shows understanding of Level 2 chemistry to explain how soaps and modern detergents are made. • Lists properties of soap that enables it to work. • Shows understanding of Level 2 chemistry to explain these properties and how soaps work. • Describes at least two advantages and two disadvantages of soap. • Describes at least two advantages and two disadvantages of detergents. • Uses typical chemistry vocabulary, symbols, conventions and equations. 	<p>The student submits a report that:</p> <ul style="list-style-type: none"> • Explains two purposes of soap/detergents. • Describes a timeline with key developments in soap manufacture. • Explains what a soap and modern detergents are in chemical terms. • Shows in-depth understanding of Level 2 chemistry to explain how soaps and modern detergents are made. • Describes properties of soaps and detergents that enables soaps to function. • Shows in-depth understanding of Level 2 chemistry to explain these properties and how soaps work. • Explains at least two advantages and two disadvantages of soap and of detergent. • Uses typical chemistry vocabulary, symbols, conventions and equations. 	<p>The student submits a report that:</p> <ul style="list-style-type: none"> • Explains two purposes of soap/detergents. • Describes a timeline with key developments in soap manufacture. • Explains what a soap and modern detergents are in chemical terms. • Shows comprehensive understanding of Level 2 chemistry to explain how soaps and modern detergents are made. • Explains properties of soaps and detergents that enables soaps to function. • Shows comprehensive understanding of Level 2 chemistry to explain these properties and how soaps work. • Discusses at least two advantages and two disadvantages of soap. • Uses typical chemistry vocabulary, symbols, conventions and equations.

ASSESSMENT TIPS

In order to achieve this standard, you need to present your report in your own words and show your understanding of level 2 chemistry.

TIP 1

If you have difficulty in transforming the text given in the links into your own words, then it is useful to ask yourself questions, such as those listed below. You can get friend or family member to ask you the questions and then record your answers. Transcribe your answers and then weave them into your report.

Please note that these questions are only **some** of the questions you could ask yourself, so don't limit your report to these only!

History/development of technology:

1. Why do we use soap?
2. What key processes were developed to make soap more cheaply?
3. When were these processes developed?
4. When was the first synthetic detergent made?
5. What caused the investigation into making synthetic detergents?
6. What other chemicals were added to synthetic detergents?
7. What problems have been caused by synthetic detergents?
8. How were synthetic detergents changed to minimise these problems?

Chemistry – How soap and detergents work:

1. Can I explain terms like 'hydrophilic', 'hydrophobic', 'cationic', 'anionic', 'micelle', 'polar' and 'non-polar'?
2. Can I explain solubility in terms of attraction, repulsion and energy?
3. Can I describe the basic structure of a soap or detergent molecule?
4. Can I write equations for all the reactions?
5. Have I written my equations using correct chemical language (e.g. using subscripts)
6. Have I drawn my own molecules and not just copied and pasted pictures from the internet?

Advantages and disadvantages:

1. Can I describe at least 2 advantages and two disadvantages for soaps and for detergents?
2. Can I explain any changes made to soaps and detergents to minimise the disadvantages?

TIP 2

When you read through the links or watch the videos given on OTLE or in the task, make notes using key words or phrases. When you write your report, use these key words rather than the text given in the links.

TOPIC RESOURCES

SOAPS AND MODERN DETERGENTS

Your first source is the modules you should have completed – CHO2001, CH2041, CH2042, CH2043, CHO2051, CHO2052

EXTRA SOURCES FOR MORE DETAIL

Videos about soaps and modern detergents:

1. Anti-bacterial soap: <https://www.youtube.com/watch?v=gdExiRwh-DQ>
2. History: <https://www.youtube.com/watch?v=toEgtWv6kBA>
3. Making of soap: <https://www.youtube.com/watch?v=IzEottrT5XA>
4. Hard and soft water: <https://www.youtube.com/watch?v=ebygQes5Wig>
5. Emulsions: https://www.youtube.com/watch?v=bC_czAL24zY
6. Environmental impacts of detergents: <https://www.youtube.com/watch?v=mgdbrRAQ2zI>
7. Biological detergents: <https://www.youtube.com/watch?v=23n4RNwptDg>
8. Carboxylic acids, typical acids and esters: <https://www.youtube.com/watch?v=3YeXGpDdgZw>
9. Solvay process: https://www.youtube.com/watch?v=VS4_wwDmoMc

Have a look at these links which give a good overview:

1. http://www.cleaninginstitute.org/clean_living/soaps__detergents_chemistry.aspx
2. http://www.cleaninginstitute.org/clean_living/soaps__detergent_history.aspx
3. http://www.cleaninginstitute.org/clean_living/soaps__detergents_products__ingredients.aspx
4. http://www.cleaninginstitute.org/clean_living/soaps__detergents_manufacturing.aspx
5. <http://www.chemistryexplained.com/Ru-Sp/Soap.html>
6. <http://knowledgeuniverseonline.com/ntse/Chemistry/advantages-disadvantages-soap.php>

These links are good at explaining the chemistry:

1. http://www.chemistry.co.nz/detergent_class.htm
2. http://www.3osomeweeks.com/Soap_Alchemy.pdf
3. <http://antoine.frostburg.edu/chem/senese/101/consumer/faq/making-soap.shtml>

These links give more detail.

1. <http://en.wikipedia.org/wiki/Soap>
2. <http://en.wikipedia.org/wiki/Detergent>

Additional sources may be used and must be quoted (full web link) in the bibliography to verify the source.