

Chemical Reactions Project

Learning Goals:

- C1.1** • I will be able to research and analyze a chemical reaction used in industry.
C1.2 • I will be able to assess the issues related to a chemical reaction used in industry.
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Research **ONE** of the topics listed below. Present your findings in an **informative brochure**. The brochure should:

- Be creative, colourful and appealing to look at
 - Use correct spelling and grammar
 - Have diagrams, pictures or graphics
 - Be original and creative!
 - Bibliography – must include a minimum of **3** sources properly cited. All information and pictures must be **referenced on a separate piece** of paper attached to the pamphlet. Marks will be deducted for an incorrect format.
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- 1. In the 1820's, Friedrich Wöhler, a German physician, carried out a simple double displacement reaction between aqueous silver isocyanate, $\text{AgOCN}_{(aq)}$, and aqueous ammonium chloride.**
 - a. Write a balanced chemical equation to represent this double displacement reaction. Use your solubility guidelines to predict the precipitate.
 - b. After the reaction, Wöhler used filtration to remove the precipitate, which he discarded. He then evaporated the water from the resulting solution by gently heating. Wöhler found, to his surprise, that the crystals he obtained were not what he expected. What compound did he obtain?
 - c. Why was Wöhler's experiment so important?
- 2. Various devices are being proposed and prototyped to capture and remove carbon dioxide from the air.**
 - a. Research one of these devices, and explain how it works. Be sure to include the balanced chemical reaction.
 - b. Describe one major advantage and one major disadvantage of the device.
 - c. Find out what happens to the carbon dioxide that is captured by the device.
- 3. Instead of releasing the sulphur dioxide gas produced during metal refining into the environment, a company may convert it into sulphuric acid.**
 - a. What is an environmental benefit of this process?
 - b. What is an economical benefit of this process for the company?
 - c. Give the balanced chemical equation that describes the production of sulphur dioxide gas during the smelting of copper.
- 4. Lakes that have been acidified through acid precipitation are sometimes limed, or treated with crushed limestone. Limestone is mostly calcium carbonate.**
 - a. What is the purpose of liming a lake?
 - b. Write a balanced chemical equation to show the effect of adding limestone to a lake that contains sulphuric acid.
 - c. What harm could result from liming?

**** CHOOSE RELIABLE WEBSITES FOR SOURCES, NOT WIKIPEDIA, YAHOO ANSWERS ETC.****

Be sure to include a reference for all the ideas that are not your own.

How to Reference a Website in Science

- **Have the references on a separate piece of paper, attached at the end of the project.**
 - **The references should be in alphabetical order, and numbered.**
1. Last name of author, First name of author. Title of web page. Date site was updated. Date you were on the site. <Web address>.
 - If no author is given, use the company name.
 - Be sure the information is from a reliable source.
 - If there is no updated date, use the date you were on the site

Example

1. Gould, Todd A. How MRI works. 2007. Feb. 8, 2007. <<http://www.howstuffworks.com/>>.
2. Hornak, Joseph P. The Basics of MRI. 2006. Feb. 8, 2007. <<http://www.cis.rit.edu/htbooks/mri/inside.htm>>.

Chemical Reactions Brochure Success Criteria

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|---|-------------|----------|----------|----------|----------|
| Content - The brochure has all of the required information and some additional information | 0 | 1 | 2 | | |
| Fully answers part (a) | 0 | 1 | 2 | | |
| Fully answers part (b) | 0 | 1 | 2 | | |
| Fully answers part (c) | 0 | 1 | 2 | | |
| Organization - All pictures, diagrams and text are exceptionally and attractively organized with proper labels and headings . | 0 | 1 | 2 | 3 | |
| Writing mechanics - Capitalization, punctuation and spelling are correct throughout the brochure | 0 | 1 | 2 | 3 | 4 |
| Communication - Communicates with a high degree of clarity - Brochure is clearly and concisely written | 0 | 1 | 2 | 3 | 4 |
| Creativity - Exceptional pictures and diagrams are used and enhance the brochure | 0 | 1 | 2 | 3 | |
| Eye-catching and colourful - Use of colour and design make brochure creative and unique | 0 | 1 | 2 | 3 | |
| Reference page - More than the required number of sources are used, in the correct format and all of the sources are credible | 0 | 1 | 2 | 3 | |
| Effective use of class time | 0 | 1 | 2 | | |
| Total | / 30 | | | | |