PPE - using gloves with 0.5M sodium hydroxide

Posted by Anonymous on Mon, 2014-08-11 11:12

PPE - using gloves with 0.5 M Sodium hydroxide. The SDS for 0.5M NaOH advises us to use gloves with the students in grade 7/8. We have always used goggles and aprons but have not been in the practice of using gloves.

Voting:
No votes yet

Year Level:
7
8
9
10
Senior Secondary
Laboratory Technicians:
Laboratory Technicians

Showing 1-1 of 1 Responses

Answer by ginny.r.ward on question Chemistry

Submitted by on 17 August 2014

Answer reviewed 28th January, 2023

Science ASSIST considers that, in most cases, the risk with Year 7/8 students using a 0.5 M solution of sodium hydroxide without gloves would not be significant, as long as the hazards are mitigated by minimising the volume of solution required. By using reliable and safe equipment, such as dropper bottles and following good hygiene procedures, the risk would be low. However, the risk would increase if the behaviour of students is poor, or if the activity involves frequent handling of the solution. A site -specific risk assessment will determine whether the risks are so significant as to warrant the wearing of gloves. The following aspects need to be considered:

Classification of the chemical:

A survey of safety data sheets for 0.5M sodium hydroxide from a range of suppliers finds that this chemical is usually assigned to health hazard skin corrosion/irritation Category 1B under the Globally Harmonised System for the Classification of Hazardous Chemicals (GHS).[1,2] The associated hazard statement is: *H314 Causes severe skin burns and eye damage*. Inclusion in skin corrosion/irritation Category 1B means that the substance has been shown to cause irreversible damage to skin on exposure to the substance for more than 3 minutes but less than one hour.[3]

This concentration of 0.5M for sodium hydroxide solutions is at the lower end of the range in this hazard category and some suppliers have classified 0.5M sodium hydroxide solution as health hazard skin irritation (Category 2). The associated hazard statement is: *H315 Causes skin irritation*. Skin irritation is defined in section 3.3.3 as "the production of reversible damage to the skin following the application of a test substance for up to 4 hours".[3]

Assessing the risk:

A risk assessment of the use 0.5 M sodium hydroxide by Year 7/8 students should take into account the following:

- the volume of the solution required for the activity.
- the amount of handling of the substance which is involved, e.g., the number of times it is transferred from one vessel to another.
- how the solution is provided to students e.g., whether it is in dropper bottles.
- the risk assessment should also consider the anticipated behaviour of the class and the likelihood that students will follow safety procedures.
- students should be instructed to wash their hands immediately after handling the substance, and immediately if they feel a slimy/slippery sensation on their skin, which the end of the activity.

The risks may be minimised by modifying the activity so that a smaller volume of sodium hydroxide is used, or so that handling of the substance is reduced, e.g., by the teacher dispensing the required volume for the student. If the activity allows, a lower concentration of sodium hydroxide could be substituted; a 0.2 M solution of sodium hydroxide is classified as health hazard skin irritation Category 2. Science ASSIST have developed a risk assessment template[4] which can act as a guide for determining the risks.

Which gloves?

Both natural latex gloves and nitrile gloves provide excellent protection for the handling of 0.5M sodium hydroxide solution.[5,6]

Hazards associated with wearing gloves:

- Wearing gloves to protect against chemicals introduces the potential for allergic reactions to latex or other materials.
- Wearing gloves when handling chemicals can be counterproductive and lead to less careful behaviour, sometimes called 'risk compensation'. Students wearing gloves when handling chemicals have been observed to touch their faces, hair and writing materials, etc. because they feel that their gloves will protect them.
- Consideration should also be given to the hazards created by disposing of contaminated gloves.

References:

[1] Safe work Australia website, (accessed 2023, January 28), '*Using the GHS'*, retrieved from https://www.safeworkaustralia.gov.au/safety-topic/hazards/chemicals/classifying-chemicals/using-ghs

[2] United nations economic commission for Europe (UNECE) website, (2021), '*Globally Harmonised System of Classification and Labelling of Chemicals (GHS Rev. 9, 2021)'*, retrieved from https://unece.org/transport/standards/transport/dangerous-goods/ghs-rev9-2021

[3] United Nations Institute for Training and Research (UNITAR) website, (2010, June), '*Understanding the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), A companion guide to the GHS Purple Book'*, retrieved from https://cwm.unitar.org/publications/publications/cw/ghs/GHS_Companion_Guide_final_June2010.pdf

[4] Science ASSIST website, (2014, July), '*Customisable risk assessment template'*, retrieved from https://assist.asta.edu.au/resource/2298/risk-assessment-template

[5] Labtek website, (accessed 2023, January 28), '*Ansell Chemical handling glove guide'* retrieved from https://www.labcoscientific.com.au/page/22/labtek ,download pdf from Ansell, listed under suppliers

[6] Ansell website, (2018, September 18), '*Why glove material matters'*, retrieved from https://www.ansell.com/au/en/industrial/safety-briefing/anz/anz_glove-polymers

---