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Chemistry

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

Chemistry: When using 0.5 M NaOH is it advised to use gloves with the students in grade 7/8. We have always used goggles, aprons but not in the practice of using gloves.

Voting:



No votes yet

Year Level:

7
8

Laboratory Technicians:

Laboratory Technicians

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Answer by ginny.r.ward on question Chemistry

Submitted by sat on 17 August 2014

Science ASSIST considers that, in most cases, the risk with Year 7/8 students using 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 the use of reliable safe equipment, such as dropper bottles, and as long as good hygiene procedures are followed. However, the risk would increase if the behaviour of students is poor, or if the activity involves frequent handling of the solution. A local 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 (the GHS).^[1] 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.^[2]

However, 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 being *H315 Causes skin irritation*. Skin irritation is defined as “the production of reversible damage to the skin following the application of a test substance for up to 4 hours.”^[2]

Assessing the risk

A risk assessment of the use 0.5 M sodium hydroxide by Year 7/8 students should take into account 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, and 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 would indicate exposure to the sodium hydroxide solution, and to wash their hands at 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.

Which gloves?

Natural latex gloves as well as nitrile gloves provide excellent protection for the handling of 0.5M sodium hydroxide solution.^[3]

Hazards associated with wearing gloves

The wearing of 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. Wearing gloves to protect against chemicals also introduces the potential for allergic reactions to latex or other materials.

Consideration should also be given to the hazards created by disposing of contaminated gloves.

References

[1] Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Third revised edition, United Nations, 2009,

http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html

[2] Understanding the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), *A companion guide to the GHS Purple Book*, June 2010 Edition, United Nations Institute for Training and Research:

http://cwm.unitar.org/publications/publications/cw/ghs/GHS_Companion_Gui...

(Broken link replaced April 2018)

[3] Ansell Occupational Health Care, Chemical Resistance Guide, 7th Edition, 2003,

http://www.ansellpro.com/download/Ansell_7thEditionChemicalResistanceGui...

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