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Posted by Anonymous on Wed, 2019-03-20 19:58

Storage of sodium metal:

We have had a few questions regarding the storage of sodium.

Container for sodium metal: We have sodium metal in the original container from 2008. The plastic container has vacuumed in slightly and I am concerned that the age of the container will become an issue. I would like to remove the sodium from this container and place it into a new container, but I am not sure how to go about it. Can you provide some advice for me, please?

I have been told that the best way to store sodium is in glass, under kerosene and in a sand bath.

My Qs are: isn't paraffin oil better than kerosene AND is a sand bath necessary or desirable?

Voting:



No votes yet

Year Level:

7

8

9

10

Senior Secondary

Laboratory Technicians:

Laboratory Technicians

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Container for sodium metal

Submitted by sat on 20 March 2019

Answer reviewed 26 February 2023

Container for sodium metal

Organic chemicals may react with plastic containers when stored in them for an extended period of time.¹ It appears that the paraffin oil in your situation may have reacted with the plastic container and/or the sodium has reacted with the oxygen in the headspace of the container, thereby creating a vacuum. Therefore, your original container has been compromised and you will need to repackage your sodium metal.

Sodium metal is highly reactive with water generating flammable hydrogen gas and sufficient heat to cause ignition. **It is essential that sodium is stored so that it cannot come into contact with water, including moisture in the atmosphere.**^{2,3} Sodium is usually supplied under paraffin oil or under kerosene. It is usually good practice to keep chemicals in the containers in which they are supplied.

Science ASSIST recommends the following for storage of sodium:

- Purchase sodium that is under paraffin oil, rather than kerosene. The use of kerosene introduces additional hazards due to it being an aspiration hazard as well as being a flammable liquid.⁵ Kerosene also has a much lower boiling point than paraffin oil and is more prone to loss of liquid by evaporation.
- Keep stocks of sodium to a minimum and only purchase as required.
- Transfer sodium to a suitable stock jar for storage if the structural integrity of the original container is compromised, or if directed by your jurisdiction.
- Sodium metal in schools is best stored under paraffin in a suitably labelled, screw capped, clear glass, wide mouthed jar.
 - The clear glass helps you see that the level of paraffin oil is covering the sodium.
 - The glass does not react with the paraffin oil
 - The wide mouth enables you to easily remove the sodium metal from the jar.
 - Consideration could be given to PVC coated glass and/or the glass jar could be stored in a secondary containment such as a chemically resistant plastic container, e.g., a polypropylene beaker.
- Minimum quantities only should be taken into the classroom for demonstrations, therefore a small jar with one small lump of sodium should be established for use in the classroom.
- DO NOT pre-cut the sodium for use in the classroom as this needs to be conducted as part of the demonstration.
- For more information regarding handling sodium metal see the SOP: Demonstrating the reaction of alkali metals lithium and sodium with water.⁶
- Regularly check that the jars are in good condition and that the sodium is covered with paraffin oil. (This is most easily done at stocktake)
- Ensure that sodium is stored in a secure locked location as it has been listed as a chemical known to be used in the illicit manufacture of drugs.⁷

Note: The use of a sand bath is not considered necessary for storage of sodium. It could mask the loss of storage fluid.

Transfer Procedure for establishing a new stock and classroom container of sodium:

- It is essential that all jars and implements used (scalpels, forceps etc.) are clean and dry. In addition, use a clean dry surface to cut it on.
- Establish 2 jars for storing the sodium: a smaller one to be used in the classroom and a larger one as a stock jar.
- The two jars should be screw-capped, clear glass, wide mouthed jars, clean and dry (air dried is sufficient) and labelled appropriately.
- Place some clean paraffin oil in the jars.
- Using dry forceps, transfer one small lump of sodium into the demonstration jar and the rest of the pieces into the stock jar.
- Cover the sodium in both jars with clean paraffin oil.
- If the sodium is in kerosene, using dry forceps, remove the sodium, blot off excess kerosene by rolling the pieces on paper towel and place under paraffin oil so that it is stored in a non-flammable liquid.
- Dispose of old paraffin oil/kerosene and container appropriately labelled via a chemical waste disposal contractor.

References and further information

1 'Nalgene Plastic Labware Chemical Resistance Reference Guide', Thermofisher website, LCD-Chemical-Resistance-Guide-GALSPCHEMRESPOSTER-EN.pdf (thermofisher.com)

2 ChemSupply Australia website, (2023), *Safety Data Sheet: Sodium metal*. Please search the product information page on the website for the current SDS for Sodium metal <https://shop.chemsupply.com.au/>

3 CLEAPSS. (2018). Sodium. (*Hazcard CLP88*) Retrieved from the CLEAPSS website: <http://science.cleapss.org.uk/Resource-Info/HC088-Sodium.aspx> (login required)

4 Flinn Scientific website, Safety FAQ *How should I store reactive metals like sodium, potassium, lithium, etc?* Retrieved (26 February 2023) <https://www.flinnsci.com/safety-faq/faq2006/>

5 ChemSupply Australia (2023), *Safety Data Sheet: Kerosene*. Please search the product information page on the website for the current SDS for Kerosene <https://shop.chemsupply.com.au/>

6 Science ASSIST. 2016. *SOP: Demonstrating the reaction of alkali metals lithium and sodium with water*, Science ASSIST website, <https://assist.asta.edu.au/resource/3591/sop-demonstrating-reaction-alka...>

7 Chemistry Australia and Science Industry Australia. 2008. *Code of Practice for Supply Diversion into Illicit Drug Manufacture*, Chemistry Australia website, https://chemistryaustralia.org.au/safety-environment/code_of_practice_fo...

Science ASSIST. 2018. *Chemical Management Handbook for Australian Schools Edition 3*, Science ASSIST website, <https://assist.asta.edu.au/resource/4193/chemical-management-handbook-au...>

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