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Disposal of products of sodium thiosulfate and hydrochloric acid

Posted by Anonymous on Thu, 2015-07-30 13:37

Disposal of products of sodium thiosulfate and hydrochloric acid: Risk assessment (thiosulfate): Do you have a RA for the reaction of 0.1M sodium thiosulfate with 2M hydrochloric acid, especially the cleaning up and disposal.

Voting:



Average: 5 (2 votes)

Year Level:

Senior Secondary

Laboratory Technicians:

Laboratory Technicians

Showing 1-1 of 1 Responses

risk assessment

Submitted by sat on 12 August 2015

Answer reviewed 12 February 2023

For anyone who wishes to carry out their own site-specific risk assessment for any science activity, we have published an [ASSIST information sheet AIS: Risk management and risk assessment](#) which offers an instructional guide on how to carry out and document a risk assessment using the Science ASSIST [risk assessment template](#). We do not develop ready-made risk assessments for specific activities carried out in schools.

Prior to conducting any science activity, it is good practice to go through the four-step process of:

1. Identifying the hazard
2. Assessing the risk
3. Implementing the control measures
4. Monitoring and reviewing the effectiveness of the control measures

For simplicity, we deal here with the chemicals used and produced in this activity:

Chemical	Hazard	Risk	Control measures	Risk with control measures *
1 mol/L sodium thiosulfate	body tissue irritant	Low	Wear safety glasses and lab coat	Low
2 mol/L hydrochloric acid	corrosive to eyes and skin	Medium	Wear safety glasses and lab coat	Low
sulfur dioxide gas	skin and eye irritant	Medium	Carry out this reaction in a well-ventilated area and wear safety glasses and lab coat	Low

*Ask this question: 'Are the risks effectively controlled?'

Disposal of waste

Waste from this activity consists of solid sulfur and other sulfur species as well as reactants in excess, such as hydrochloric acid. We suggest that used glassware be cleaned as soon as possible after the activity, using a bottle brush and detergent and then rinsed (or washed in a dish washer); this will reduce the likelihood of a film of sulfur drying on the glassware.

The best practice for dealing with the waste from this reaction is as follows:

1. Working in a fume cupboard, neutralise the collected waste with a carbonate, such as a solution of sodium carbonate or solid sodium carbonate or calcium carbonate (as powder or marble chips) in portions, until all the acid has been depleted and there is no further bubbling off of carbon dioxide. The neutralisation point can also be determined by using an indicator such as universal indicator to achieve a pH of between 6–8.
2. Once neutralised, the solids in the waste mixture should be filtered out before flushing the filtrate down the sink. A funnel with a wad of cotton wool is adequate for this purpose. This way all the sulfur species present in solution are removed together with other insoluble matter.
3. The separated insoluble matter with sulfur products can be disposed of together with general waste given that the quantities produced in this activity are small. Please refer to our previous response on [sulphur disposal](#) for further information.

Disposal of a minimal quantity

If the class size and hence, the quantity of waste, are very small, then the amount of sulfur residue would be negligible and there would be only a small amount of excess hydrochloric acid in the waste mixture. The waste from this activity could then simply be diluted further with plenty of water before disposing of down the sink.

References

Flinn Scientific Inc. 2023, 'Rate of Reaction of Sodium Thiosulfate and Hydrochloric Acid', Rate of Reaction of Sodium Thiosulfate and Hydrochloric Acid (flinnsci.com)

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

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