

## RISK ASSESSMENT

**Subject:** Yr 10 Science

**Date conducted/last reviewed:** Term 2 2010

**Experiment /Task:** *Unit:* Chemistry

*Topic:* Experiment 4 – Lead by Smelting

*Experiment:* 210

<b>Brief description of experiment:</b>		
To extract lead from lead oxide by smelting on a match head.		
<b>Risk Level: HIGH (level 3)</b>		
<b>HLS-PR-012 Curriculum Activity Risk Management Modules:</b>		
<ul style="list-style-type: none"> <li>• Chemical Hazards</li> <li>• Maintenance and operation of a safe laboratory</li> <li>• Safe work practices conducting science experiment activities</li> <li>• Maintenance &amp; operation of a safe work area outside the laboratory</li> <li>• Safe operation of laboratory equipment</li> </ul>		
<b>Hazards</b>		
<ul style="list-style-type: none"> <li>• Burns – hot objects, naked flame.</li> <li>• Environmental – fumes.</li> </ul>	<ul style="list-style-type: none"> <li>• Lead oxide – toxic via all routes of contact, irritant.</li> </ul>	
<b>Risks of chemicals used:</b>		
<b>Substance</b>	<b>Hazard alert code</b>	<b>Risks &amp; Control</b>
Lead Oxide		
<b>Risk Control Measures:</b>		
<ul style="list-style-type: none"> <li>• Use of safety goggles.</li> <li>• Long hair tied back.</li> <li>• Teacher reviews experimental procedure with class and reviews use of Bunsen burners.</li> <li>• Teacher controls lead oxide. Students only use small amounts of chemical.</li> <li>• Students informed regarding the hazards of the chemicals used.</li> </ul>	<ul style="list-style-type: none"> <li>• Used lead is returned to students immediately.</li> <li>• Lead is never handled.</li> <li>• Room well ventilated.</li> <li>• Clean work areas.</li> </ul>	
<b>Standard Operating Procedure:</b>		
<b>Using a Bunsen burner</b>		
<ul style="list-style-type: none"> <li>• Long hair must be tied back.</li> <li>• Teacher always reviews use of a Bunsen burner prior to use.</li> <li>• Bunsen burner must be used on a heatproof mat.</li> <li>• Before turning on the gas main, all gas taps must be checked to ensure they are closed.</li> <li>• Students must inform the teacher of any problems with a Bunsen burner.</li> <li>• The Bunsen burner must be lit to give an orange flame {safety flame}.</li> <li>• A blue flame must be used when heating.</li> <li>• An orange flame must be used when the Bunsen is not being used for heating.</li> <li>• Lit Bunsen burners must not be left unattended.</li> <li>• Used matches are to be placed on the heatproof mat until cool, then discarded in the bin.</li> <li>• To extinguish the flame students must close the gas tap.</li> <li>• The teacher must caution students when packing away Bunsen burners to avoid burns. Allow Bunsen to cool slightly prior to packing away.</li> </ul>		

- Gas main must be turned off at the conclusion of the experiment.

### **Chemical Use**

- Goggles at all times, including during collection of chemicals and packing up.
- Dilute solutions used wherever possible.
  - . Small amounts used wherever possible.
- Most solutions provided in small dropping bottles.
- Solutions added to test-tube whilst in test-tube rack
  - . All chemical containers are clearly and informatively labelled, including risks.
- Chemicals with an extreme hazard alert code may only be used by senior students or teacher demonstration.
- Benches wiped down at the end of the experiment.
- Chemicals are returned neatly to experiment tray.
  - . Students wash hands with soap AFTER the experimental area is cleaned. . All spillages and breakages reported to teacher.
- Vinegar and sodium bicarbonate solutions provided for the cleaning of acid/base spills.
  - . Keep combustible substances away from naked flames.
- Room must be well ventilated where fumes are produced.
  - . Gloves and aprons may be necessary with the use of some chemicals, as identified by the risk assessment.
- Use waste containers provided, where applicable. Check correct disposal of chemicals and wastes.
- No chemicals must remain in the laboratory at the completion of the lesson. This includes leaving chemicals in unlabelled beakers or test tubes in the laboratory.
- A risk assessment is included with the science activity.
- For chemicals with a high/extreme hazard alert code, a mini MSDS is provided with the experiment.
  - . Lead register is completed where an experiment/activity uses lead metal or lead compounds. .
- For each chemical stored, a copy of the appropriate material data safety sheet is readily accessible to teachers, and available to students where applicable.
- Scientific assistants notified of damaged containers, e.g. cracked lids.
  - . Mercury, sodium metal and concentrated acids are for teacher demonstration only. These substances must be collected by the teacher from the prep-room storage area, and returned immediately. They must not be returned to, and remain in, the experiment tray. Instructions reminding teachers of this procedure is placed in the experiment tray.

\* Relevant teachers are to review and assess the risk assessment for their own class