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**SSERC Risk Assessment** (revised version March 2018)

(based on HSE’s INDG 163 ‘Risk assessment - A brief guide to controlling risks in the workplace’)

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| Activity assessed | Gravimetric determination of nickel using dimethylglyoxime |
| *Date of assessment* | August 2022 |
| *Date of review (****Step 5****)* |  |
| *School* |  |
| *Department* |  |

| Step 1 | Step 2 | Step 3 | Step 4 | | |
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| *List Significant hazards here:* | *Who might be harmed and how?* | *What are you already doing?*  *What further action is needed?* | *Actions* | | |
| *by whom?* | *Due date* | *Done* |
| Nickel chloride is toxic if swallowed or inhaled, carcinogenic if inhaled, a mutagen and reproductive toxin, a skin irritant and sensitiser and causes organ damage to the lungs. | Technician while preparing solution by splashes or inhalation.  Pupils by splashes or inhalation while carrying out experiment. | Avoid raising dust. Wear goggles (BS EN166 3) and gloves.  The solution is less hazardous but still a carcinogen, mutagen, skin sensitiser, organ toxin and possibly a reproductive toxin.  Inhalation though, is unlikely unless an aerosol is produced. Wear goggles (BS EN166 3) and gloves. |  |  |  |
| Dimethylglyoxime is a flammable solid and is toxic if swallowed | Technicians while preparing solution. | Keep away from sources of ignition. |  |  |  |
| The dimethylglyoxime solution is prepared in ethanol (IMS) which is highly flammable.  IMS is also harmful if swallowed and can cause damage to organs. | Technicians while preparing solution or pupils while carrying out experiment by fire. | Keep away from sources of ignition.  The toxicity is minor unless it is drunk in quantity. Working in a well-ventilated room will mitigate issues of inhalation. |  |  |  |
| Hydrochloric acid is corrosive to skin and eyes and produces irritating fumes.  A 2 mol l-1 solution is of no significant hazard. | Technician preparing 2 mol l-1 solution by splashes or inhalation. | Work in a fume cupboard unless the volume is very small.  Wear goggles (BS EN166 3) and gloves. |  |  |  |
| Hydrochloric acid is corrosive to skin and eyes and produces toxic fumes. | Technician preparing 2 mol l-1 solution by splashes or inhalation. | Work in a fume cupboard. Wear goggles (BS EN166 3) and gloves. |  |  |  |
| 2 mol l-1 ammonia causes serious eye damage and can produce irritating fumes | Pupils while carrying out experiment by splashes. | Wear goggles (BS EN166 3) and work in a well-ventilated laboratory. |  |  |  |

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| **Description of activity:**  Nickel chloride is dissolved in water and an alcoholic solution of dimethylglyoxime is added along with ammonia to keep the solution alkaline.  A red precipitate of the complex is formed. This is filtered off, dried and weighed and this information can be used to determine the amount of nickel in the original solid. |

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| **Additional comments:**  Nickel compounds are toxic to the environment so the complex and any other nickel residues must be kept for uplift by a licensed waste contactor |