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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 | Quantitative Electrolysis |
| *Date of assessment* | 7th December 2021 |
| *Date of review (****Step 5****)* |  |
| *School* |  |
| *Department* |  |

| Step 1 | Step 2 | Step 3 | Step 4 | | |
| --- | --- | --- | --- | --- | --- |
| *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* |
| Sulphuric acid is an oxidiser and highly corrosive | Technician making dilute solutions by spills | Wear a face mask or goggles (EN 166 3) and gloves. |  |  |  |
| 0.1 mol l-1 sulphuric acid is of no significant hazard |  |  |  |  |  |
| Hydrogen and oxygen produced by electrolysis could form an explosive mixture | Pupils and teachers by explosion of the mixture. | The chance of this happening is very low but to be sure, make sure there are no sources of ignition nearby and work in a well-ventilated room.  If you are collecting a hydrogen/oxygen mixture, d**o NOT** try to ignite the gas mixture produced to test it. A stoichiometric mixture like this is highly explosive and could cause serious hearing damage and injuries from shattered glass. |  |  |  |
| Electrolysis can produce an aerosol of sulphuric acid which is hazardous if inhaled (corrosive) | Pupils and teachers by inhalation of the aerosol. | The fact that one of the electrodes is covered by a measuring cylinder will reduce the risk.  Work in a well-ventilated room and do not use too high a voltage.  (Ideally cover the other electrode as well) |  |  |  |
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| **Description of activity:**  A dilute (0.1 mol l-1) solution of sulphuric acid is electrolysed and the hydrogen gas collected and the volume measured, along with the current and time.  This allows the number of coulombs to be calculated.  The experiment as described only collects hydrogen at the cathode. As an extension, oxygen can also be collected at the anode and a similar calculation done. This would also be safer as there would then be no escape route for sulphuric acid aerosol. |

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| **Additional comments:**  All electrical equipment should be checked for safety before use.  Disposal – the dilute acid can be roughly neutralise with an alkali and washed to waste with lots of cold running water. |