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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 | Dye Sensitised Solar Cells Activity |
| *Date of assessment* | 8th December 2019 |
| *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* |
| Ethanol is highly flammable. | Technicians, teacher and pupils. | Keep away from any sources of ignition. |  |  |  |
| Ethane-1,2-diol is harmful if ingested | Technician by ingestion of splashes while preparing solution. | Quantities are small and toxicity is low so the risk is slight. Normal lab hygiene should suffice. |  |  |  |
| Iodine is harmful if inhaled and in contact with the skin. | Technician by inhalation of vapour or splashes while preparing solution. | Work in a well-ventilated area. Quantity is likely to be small but consider wearing gloves |  |  |  |
| Iodine solution is of no significant hazard. |  |  |  |  |  |

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| **Description of activity:**  Students extract dyes from plants (e.g. chlorophyll from spinach, from beetroot and from hibiscus flowers although many more plant sources can be used). Filter paper is then soaked in the dyes and dried. The ability of the dye to absorb light is then tested via the light box fitted with a bulb and an LDR.  They then compare the voltage and current produced when these dyes are each used in a cell. This gives an opportunity for numerical work and drawing graphs.  Pupils then proceed to make a cell using hibiscus dye. They can then connect them is series to power a calculator. |

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| **Additional comments:**  About 6 hibiscus cells are needed in series to power the calculator. Ensure pupils do not rub the surfaces of the electrodes together or touch the surfaces as this will damage the electrodes. To regenerate the dyed electrode, place it in a dish of distilled water under a fluorescent lamp or on a windowsill for a few days. Then remove and allow to dry naturally on paper towel (do not rub the titanium oxide surface!). |