



Figure 11 – Both the melody module and the calculator will function using solar cells.

Once again, if the terminal graphite electrode is connected to the positive (red) wire of the calculator, and the terminal titanium dioxide electrode connected to the negative wire, the calculator will function when connected to six hibiscus-dyed solar cells arranged in series and switched on.

A package of teaching and learning materials is now available as a SSERC workshop where delegates extract dyes from plants, test them for their suitability; and then try them in Gratzel cells.

For workshop booking details contact [sts@sserc.org.uk](mailto:sts@sserc.org.uk)

Chemicals & procedures	Main Hazard	Control Measures
Iodine/tri-iodide electrolyte	Harmful indirect vent goggles.	Wear nitrile gloves and
Glass electrodes (assembling solar cell)	May have sharp edges and may break if pressed too hard.	Hold glass electrodes carefully and add bulldog clips gently.
Boiling water for dye-bath	Scalding	Don't touch or move beaker containing the boiling hot dye-bath.

Table 2 – Hazard and Control Measures

### Sources of materials:

- [1] MAN SOLAR B.V., Westerduinweg 3, 1755 LE Petten, The Netherlands  
E-mail: [mansolar@ecm.nl](mailto:mansolar@ecm.nl)  
Internet: <http://www.mansolar.com>
- [2] Hibiscus 'flowers', 'Hibiscus tea' or 'Flor de Jamaica' can be purchased in many health food stores. Alternatively dried Hibiscus flowers can be purchased on the internet for about £2 per 100g (e.g. [www.Mexgrocer.co.uk](http://www.Mexgrocer.co.uk)) or MexGrocer.co.uk, 1 Tennyson Rd, Stockport, SK5 6JJ.  
Tel : 0800 849 9042 (Information Line Only)



### Dry Ice Maker

We have recently had a query about one of these not working. It transpired that the problem could well have been with the type of gas cylinder and not the attachment. Dry ice making attachments will only work with a particular type of CO<sub>2</sub> cylinder. The cylinder must be fitted with a dip tube (this is often referred to as a 'siphon type' cylinder). This allows liquid CO<sub>2</sub> to be siphoned from the bottom of the cylinder.

Therefore, if you are considering purchasing a dry ice maker check if your cylinder is fitted with a siphon tube.[1]

For example, suitable cylinders from B.O.C. are black with two white stripes, diametrically opposite, indicating that it has a siphon tube and is suitable for making dry ice.

### Reference

- [1] [http://www.practicalphysics.org/go/Guidance\\_24.html](http://www.practicalphysics.org/go/Guidance_24.html)  
This site gives further information on types of CO<sub>2</sub> cylinders and links to suppliers of dry ice making attachments, with the catalogue numbers etc.