

## Making a Grätzel Cell Equipment list

Materials per group:

### **General Materials:**

Scotch Tape  
Spatula  
Glass rod  
Beaker of water  
Pipettes  
Multimeter  
Paper towels  
Small crystallizing dish  
2B pencil  
beaker  
Tweezers  
Spare  
2 x small bull dog clips  
Torch  
2 x crocodile clip leads  
Hot plate

### **Chemicals and speciality materials:**

2 x FTO (conducting glass slides) slides  
- These are available from ManSolar  
or you might be able to get some free  
conducting glass from a company  
like Pilkington Glass.  
Template for sticking down slides  
Colourless detergent  
Titanium dioxide  
-Titanium (IV) dioxide nanoparticles  
P25 ~21nm particle size is available  
from Sigma-Aldrich  
2-3 raspberries  
Dilute acetic acid or colourless vinegar  
Iodine solution – 5% w/v I/10% w/v KI  
(in 25ml, 1.25g I and 2.5g KI)

### **Preparing the electrodes:**

Cut the FTO glass into slides of approximately 1.5 cm X 2.5 cm. Clean them using soapy water and then ethanol.

### **Preparing the Titania paste:**

Take some titanium dioxide nanoparticles powder. Mix with dilute acetic acid or colourless vinegar and clear detergent until it is a uniform paste that spreads well over the glass to make a thin layer. You have to do it by eye. If it is a bit thick, just add a little water.

### **Disposal:**

If disposing of the glass electrodes, place them in a sharps or glass bin. It may be possible to recycle the electrodes, depending on how easily the titanium dioxide is removed and whether the conductivity of the glass remains intact.