

Nanocrystalline Solar Cells Lab Instructor Guide

Instructor Pre-Lab Procedures

Preparing the TiO₂ suspension from pure, bulk TiO₂ (Degussa P25):

1. Weigh 6 g of colloidal TiO₂ power and place in a mortar.
2. Using a mortar and pestle, grind the TiO₂ powder.
3. One milliliter at a time, add 9 mL of 0.1 M acetic acid solution to the TiO₂. Before adding each additional milliliter, grind the solution until it is uniform and lump-free. This should take about 20 minutes.
4. Add one drop of surfactant (dish soap) to 1 mL of water. Add this solution to the TiO₂ paste. Do not grind or agitate the paste after the surfactant is added.
5. Put the TiO₂ in the dropper bottle provided.

Preparing the TiO₂ suspension from toothpaste:

1. Heat approximately 7 g of toothpaste in a crucible up to 500⁰C for 3 hours in air atmosphere (this will produce approximately 6 grams of powder).
2. Follow steps 2-5 from procedure above.

