CdTe nanowires: preparation and properties

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Nanostructures are of great interest due to many reasons. By reducing the dimensions from bulk to nanostructures one can consequently shrink the dimensions of a device and obtain a better control of its proprieties and a reduction of the used resources. Among the nanostructures nanowires (quasi 1 dimensional structures) have remarkable characteristics derived from their high surface to volume ratio which makes them more sensitive to surrounding stimuli.

CdTe is a semiconductor which has applications ranging from solar cells to transistors. Electrodeposition is a suitable technique to obtain CdTe nanowires, one of the advantages of this method being the low cost, the control the compositional characteristics and also the properties of the material being similar to those in more expensive methods. Polycarbonate ion track membranes were used as templates to prepare CdTe nanowires.

Morphological (SEM), optical (reflection) and structural (XRD) measurements were performed in order to assess the quality of the nanostructures. Further, in order to investigate the detector/transistor features of CdTe nanowires these were contacted using a combination of methods i.e. of electron beam lithography and photolithography. Thus, electrical properties were measured for individual, tailored CdTe nanowires.