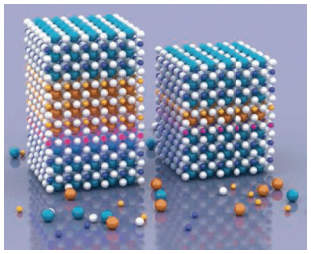
Thin films

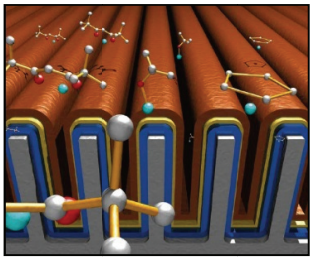
From an international perspective, we have a unique thin film laboratory here at UiO where materials ranging from organic- inorganic hybrid materials, oxides and heterostructures of rather complex oxide materials such as perovskites are produced. The main deposition technique is atomic layer deposition (ALD) where the film is built atom-by-atom. The tasks related to these facilities range from exploratory chemistry, film growth and in situ characterisation, physical characterization, theoretical modelling, and more... A brief outline of some of the master projects that you can be involved in is given below. Please contact us and ask for more specific information where you find your interest.

Complex oxide heterostructures



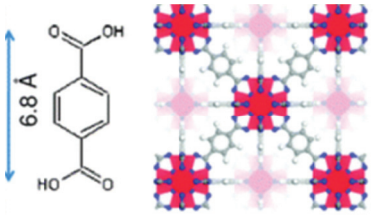
It is not always the material itself that determines the properties. In 2004 it was discovered that the interface between the two insulating materials $LaAlO_3$ and $SrTiO_3$ becomes superconducting! Other exotic phenomena can also be obtained. We work with $KNbO_3$ and $KTaO_3$ towards other materials to form new types of heterostructures.

Thin film batteries



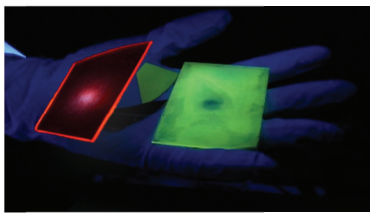
Thin film batteries are applicable for small implantable devices or flexible electronics, as well as forming the foundation of the next generation large scale batteries to come. We are in the fore-front of this field and have processes for several cathode materials, electrolytes and anode materials and the main challenge is now in integrating it all into a functional battery.

Hybrid materials



Hybrid materials are a new class of compounds consisting both of inorganic and organic functional building units. We are world leading in this field and have a desire to push the borders even further. Our desires range from expanding the type of building blocks to sulphur based ones to obtain electronic properties, to continue in developing the infant area of porous metalorganic framework materials (MOF) by thin films, and to produce biocompatible surfaces that control cell growth. This is a wide field with a huge range of applications and collaborators.

Conversion materials



Imagine the possibility to control the wavelength of light… this can enhance the efficiency of solar cells in an easy manner and also enable new types of sensors for diagnostics. We have good experience in production of efficient photoconverters by controlling the distance and environment between absorbing and luminescent elements.

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