

Scientists take on the crystal maze

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Scientists at the University of Manchester are to create the first 3D model of the maze-like crystals known as Zeolites.

Professor Michael Anderson of the University's Centre for Microporous Materials will lead an international research team in a bid to create the first 3D 'map' of the material.

Zeolites are porous crystals commonly known as molecular sieves. They are made up of a complex maze of tunnels which can be used to purify or filter materials such as water or crude oil when they are passed through the crystal.

The aim of the three-year project is to understand how Zeolite crystals grow in order to gain a better understanding of their morphology. If successful, the model will then be used to inform new techniques for controlling crystal growth.

Professor Anderson said: "If we can create a model of the complex 3D puzzle inside porous materials such as Zeolites we will be one step closer to understanding how to control the growth and final shapes of these crystals.

"If we can control crystal growth then we will have the potential to create defect free crystals with unlimited applications in electronics, oil refinement and even nuclear clean-up."

An analytical technique known as Atomic Force Microscopy (AFM) will

be used to map the topology of the material at a sub-nanometre scale. Electron Microscopy will also be used to analyse the crystal interior structure and defects. Both techniques will be combined with advanced theory and modelling techniques to create the model.

The research will be funded by a £1.1m grant from the Engineering and Physical Sciences Research Council.

Professor Anderson added: “We hope to substantially improve the fundamental understanding of the crystal growth of a whole class of nano-porous materials.”

Source: The University of Manchester

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