

Our Light Materials

A Lecture-Demonstration

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Human history has been always been characterised by a drive to discover new materials with better properties and improved processability. Stone was thus superseded by bronze, bronze by iron, and iron by steel, aluminium and a wide range of other metals and alloys. In the 21st century we are living in an age dominated by materials which, like our own bodies, are predominantly based on the chemistry of carbon. The key finding, made in the first half of the 20th century, was that materials comprising long chains of carbon (and a small number of other types of atom) had outstanding physical strength and yet could be easily processed into fibres, films and moulded objects. Since that initial discovery, which quickly resulted in the development of materials such as nylon, polyethylene, polyester, and synthetic rubber, research in polymer chemistry has continued to yield remarkable results. The past few decades have thus



seen the development of synthetic polymer fibres such as *Kevlar*[®] which is as strong as high-tensile steel and yet four or five times lighter, and high-melting, lightweight thermoplastics such as *Victrix-PEEK*[®], (discovered in the 1970's by ICI polymer scientists) which is so strong and resistant to high temperatures that it is now used in the construction of high-performance aircraft. The present lecture will explore the science behind these advanced polymeric materials, and will highlight some of the latest research in this field.

Biographical details

Following degrees at Cambridge (MA) and London (PhD), Howard Colquhoun carried out research at the ICI Corporate Laboratory in Cheshire before moving to Manchester University in 1994 as a Royal Society Industry Fellow. He was appointed to the newly-established Chair of Materials Chemistry at the University of Reading in October 2000.