

# Chemistry for Tomorrow's World

## Conservation of scarce natural resources



Raw materials and resources are becoming increasingly scarce. Minerals are essential for our way of life. The average car, for example, contains over 30 mineral components including iron, steel, aluminium, carbon, silicon and zinc.<sup>1</sup> At current rates of use, and without the development of any new technology, indium, an element used in liquid crystal displays and solar panels, is expected to be exhausted by 2020. Antimony, which is used to make flame retardant materials, is estimated to run out by 2030, and silver by as early as 2017.<sup>2</sup>

To sustain the current quality of life in the developed world, and also make this quality achievable globally, scientists and engineers must develop a range of alternative materials. Processes are also needed to recover valuable components at the end of a product's life. Legislation should be designed to regulate use and recovery of scarce resources.

### How can the chemical sciences help?

- In order to conserve precious resources, the amount of material used in current and new technological devices must be reduced and optimised. This will be achievable through the development of nanotechnology and smart materials, which are tailored to specific uses.
- The use of scarce resources in non-technological roles, such as fertilisers, must also be managed through understanding the chemistry of how they are used, and how they could be more effective.
- Where materials cannot be replaced they should be reclaimed at the end of the product life. Metals should be recovered from electronic waste and extracted from contaminated land and landfills. Scientists and engineers will need to develop new methods to make this process cost-effective.

### About the RSC & Chemistry for Tomorrow's World

The Royal Society of Chemistry (RSC) is the leading society and professional body for chemical scientists. Over 2008 and 2009, it gathered expert views to identify priority areas where the chemical sciences can play an important role in the development of society.

For more on this initiative please visit our website: [www.rsc.org/roadmap](http://www.rsc.org/roadmap), contact us at [roadmap@rsc.org](mailto:roadmap@rsc.org) or call the RSC science team on +44 (0)1223 432424.

<sup>1</sup> United States Geological Survey Mineral Resources Program  
<http://minerals.usgs.gov/granted.html>

<sup>2</sup> *New Scientist*, 23 May 2007, David Cohen, Issue 2605