

## MATERIALS SCIENCE

### Quick-cook nanotubes

It's as quick and easy as making popcorn: carbon nanotubes can be produced by microwaving a mixture of compounds for 15–30 seconds under ambient conditions.

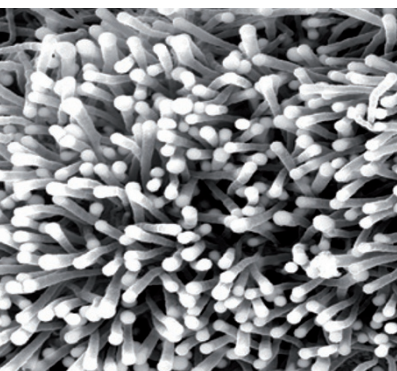
Microwave irradiation heats one of the constituents, a conductive material such as indium tin oxide, to above 1,100°C. This raises the temperature of the accompanying ferrocene, an iron-based organic compound. As a result, the ferrocene decomposes into an organic molecule that serves as the nanotube precursor, and into iron — which functions as a catalyst for nanotube synthesis.

Xinyu Zhang at Auburn University in Alabama and his colleagues made nanotubes several micrometres in length (**pictured**), which they then deposited on filler materials such as fly ash and glass fibres. Tests showed that the addition of the modified fillers to an epoxy-resin-based foam improved its fracture toughness significantly.

The authors say that their economical and scalable process may be a 'greener' way to make nanotubes than current alternatives.

*Chem. Commun.* 47, 9912–9914 (2011)

R. SOC. CHEM.



J. SCOTT & A. SCOTT/NHPA/PHOTOSHOT

## ZOOLOGY

### The secret life of seals

Rather than wait on shore to mate within male-dominated harems, some female elephant seals engage in sex at sea, challenging the assumption that the species is exclusively polygynous.

Nico de Bruyn at the University of Pretoria in South Africa and his colleagues analysed 25 years' worth of data from tagged southern elephant seals (*Mirounga leonina*; pictured) living in the ocean around Antarctica. The data suggested that many females do not come ashore to mate. During the final decade of the study, the researchers followed the movements of 53 females after fitting them with

satellite-tracking devices. This confirmed that two individuals gave birth despite not having come ashore to mate during the previous breeding season. One of these females was too far north at the time of conception to have mated on an ice floe, suggesting sexual encounters at sea.

The authors say that females from seemingly highly polygynous species may pursue alternative mating strategies rather than relying on male competition alone to secure high-quality partners.

*Anim. Behav.* 82, 445–451 (2011)

## CHEMISTRY

### Facile fluorine functionality

The trifluoromethyl motif ( $-CF_3$ ) is popular in pharmaceuticals; it is often used to fine-tune a drug's activity, for example in the anti-inflammatory celecoxib. But few reactions can attach the  $CF_3$  group to compounds and most involve reagents that are tricky to handle.

Phil Baran and his team at the Scripps Research Institute in La Jolla,

California, report that sodium trifluoromethanesulphinate ( $CF_3SO_2Na$ ) readily adds  $CF_3$  to organic heterocycles — carbon-based rings that contain other atoms, such as nitrogen, and that are commonly used by the drug industry.

The reagent is stable and cheap, and the reaction occurs at room temperature without a catalyst.  $CF_3$  replaces a hydrogen atom in a carbon–hydrogen bond that doesn't first have to be activated by other reagents. The team used the reagent to make a variety

of compounds, including the antiviral trifluridine.

*Proc. Natl Acad. Sci. USA* <http://dx.doi.org/10.1073/pnas.1109059108> (2011)

## GENE THERAPY

### Long-term fix for SCID kids

Gene therapy has shown lasting benefits for the immune systems of a small number of children with a rare and fatal immune-deficiency disease.

More than ten years ago, Adrian Thrasher and