However, given the dominance of LCDs in the display market, P-OLED technology has struggled in the commercial world and has yet to fulfil its potential. Despite significant success in the laboratory, CDT has struggled to hit breakeven and has been regularly posting a financial net loss. In the second quarter of 2007 the firm reported a net loss of \$7.4 million, up from \$5.0 million in the same period the previous year.

However, Sumitomo Chemical has sufficient confidence in the technology to justify the \$285 million price tag (\$12 per share) that it will cost to acquire CDT. The two companies are not strangers and have been working together since 2001. In 2005 they launched Sumation, a joint venture established to advance organic polymers for optoelectronic applications. In August 2007 Sumation announced an increase in the operational lifetime of P-OLED materials, a vital consideration if the technology is to become a commercial success. Using a red light-emitting material, the spin-coated device lasts for 67,000 hours before the luminance drops to half of its initial value of 1,000 cd m^{-2}. This is an impressive 260% improvement over results announced just 5 months previously, when advancements were also reported for green, blue and white light-emitting devices. "Commercial quantities will be available to our customers in the near future," said Susumu Miyazaki, Chief Executive Officer of Sumation, speaking at the time.

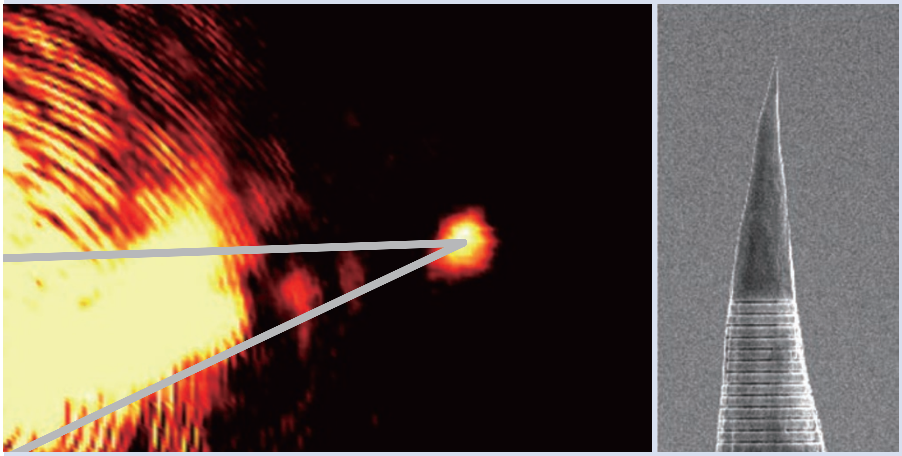
Certainly both Sumitomo Chemical and CDT are upbeat about the latest acquisition and believe it will speed the development of P-OLEDs into a commercial technology. David Fyfe, Chairman and Chief Executive Officer of CDT commented, "I believe the acquisition of CDT by Sumitomo Chemical will significantly enhance the prospects of P-OLED technology adoption, especially as P-OLED is looking ever more likely to become the next mainstream display technology."

Hiromasa Yonekura, President of Sumitomo Chemical also emphasized the importance of the merger: "OLEDs are expected to see considerable market growth in the future as next-generation materials for flat-panel displays and lighting applications, and our company is actively engaged in the development of new materials and the improvement of device technologies." Sumitomo Chemical sees display materials as an important area of its business and has already invested heavily in developing LCDs, which it hopes to continue alongside its commitment to OLED displays.

The combination of CDT, with its comprehensive patent portfolio, and Sumitomo Chemical, with extensive chemical technology know-how and net sales approaching ¥1.8 trillion (\$15 billion) in 2006, will increase the chances that P-OLED technology will be a commercial success. The merger is expected to be confirmed during a meeting of CDT shareholders to be held later in the year.

NANOSCALE LIGHT

To the point



With the aid of surface plasmon polaritons (SPPs), optical researchers could potentially open up greater levels of light control on the subwavelength scale. But it's not easy to efficiently convert travelling SPP waves into highly localized 'hot spots' of light. Claus Ropers and colleagues in Germany and the USA have now made headway on this front (*Nano Lett.* doi: 10.1021/nl071340m; 2007).

Researchers have already toyed with the idea of launching surface plasmons onto sharp, tapered metallic structures to concentrate the optical energy into a tiny, intense spot for further use. A number of apertureless near-field imaging and spectroscopy techniques could benefit from having a very localized light source at the end of such a tip, as it would allow a significant reduction in the amount of far-field background light that illuminates the sample.

In their latest work, Ropers *et al.* focus SPPs onto sharp conical gold tapers with a tip radius of just a few tens of nanometres and an opening angle of about 15°. A one-dimensional grating (with 750-nm periodicity) is electrochemically etched onto the shaft of the cone, several micrometres from the tip end. By illuminating the grating with femtosecond laser light, SPPs are excited, which then travel along the shaft to the tip apex where they are radiated into the far field. A microscope objective and video camera or spectrometer are used to collect the scattered light and study it.

At the tip, the SPPs converge to form an intense radiative local light spot. The field is enhanced by about a factor of ten at the tip, and the excitation spot size reduces to a few tens of nanometres from a few micrometres in and near the grating. Moreover, the excitation is very efficient: for optimized coupling conditions, the total power of the light scattered from the tip is only about 0.1% to 1% of the incident light, that is, about 1 µW to 10 µW for an incident power of 1 mW.

Scattering losses are minimized by using tips with minimal surface roughness between the grating and the tip apex. By varying the angle of incidence of the incoming laser beam, the tip emission can be spectrally tuned. These tiny tips could serve as bright light sources for use in nanospectroscopy and near-field imaging, where modulation techniques are usually needed to extract the near-field signal from far-field background light.

Amber Jenkins