

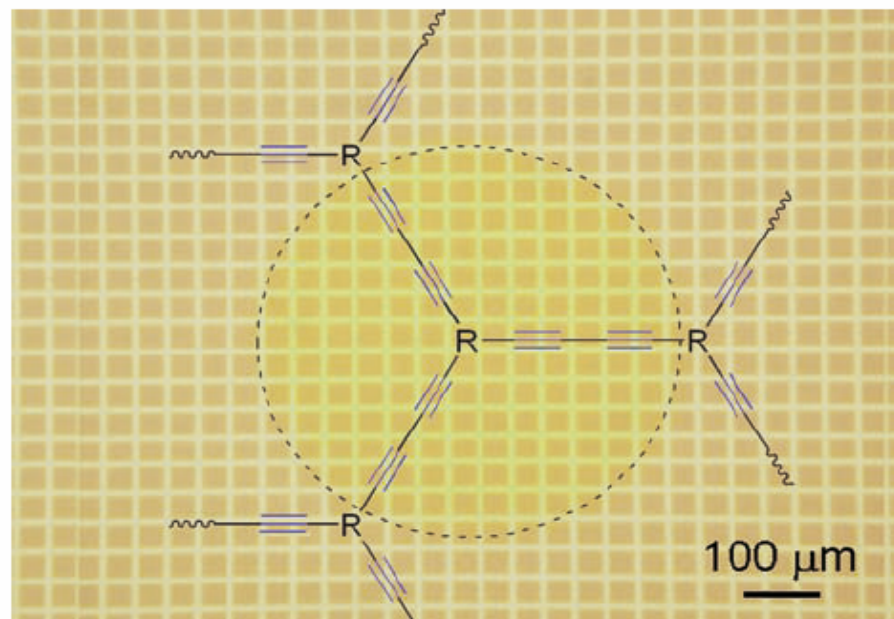
Organometallic cluster enhances polymer's optical properties

Tunable photonics with high refractive index

Scientists in Hong Kong have created a polymer with a refractive index that can be tuned as high as 1.81.

The refractive index (RI) is a measure of how much the speed of light is reduced in a medium. Conventional organic glasses such as PMMA have a particularly low RI and also within a narrow range. Therefore although they are cheap to produce, flexible and easy to coat onto large surfaces, their optical properties are limited.

Ben Zhong Tang's group from the Hong Kong University of Science and Technology have attached organometallic nanoclusters to the triple bond network of a hyperbranched polydiyne. This had the effect of increasing the refractive index to 1.81, vastly improving its optical performance.



In addition, they discovered that under UV irradiation the organometallic moiety broke away from the polymer complex. This caused the RI to drop by as much as 0.05 in the 1500–1600 nm region,

The polymer is a hyperbranched polydiyne

producing a visible photochromic response.

‘Such an unusually high RI change makes our polymer an interesting material for waveguide, memory and holographic storage applications,’ said Tang.

In the future, the group hope to induce the change in the RI of this polymer in a reversible manner. They believe that this could lead to write and read as well as erase and rewrite optical memories. ‘Such photonic materials could dramatically enhance the data processing speed and give optical holographic data storage applications with much higher accessible capacity,’ said Tang.
Jenna Wilson

Reference

M Häußler *et al*, *Chem. Commun.*, 2007, DOI: 10.1039/b702915b