

Zeolites under the microscope

Dutch scientists have shown that confocal fluorescence microscopy can be used to probe the properties and performance of zeolites, arguably the most important industrial catalysts.

At the catalytic heart of the porous zeolite structure are Brønsted acid sites. The researchers highlighted these catalytically active sites using the reactive small molecule thiophene. Although non-fluorescent as a monomer, thiophene oligomerises in the presence of Brønsted acid catalysts, becoming fluorescent in the process. When viewed through a confocal microscope, the more brightly a spot in the zeolite fluoresces, the more catalytically active that point is in the structure. In addition, the team used a second probe, a non-reactive dye called Nile Blue A, to coat the zeolite surface and so highlight zeolite particles held within the catalyst matrix.

The work, which was published in *Nature Chemistry* (DOI: 10.1038/nchem.1148), could provide new insights into the way zeolites fail as they age.

