

# Metal Hydroxide Nanofibers

Cadmium hydroxide nanostrands with a diameter of 1.9 nm were spontaneously formed by raising the pH of a dilute  $\text{Cd}(\text{NO}_3)_2$  solution. The length reaches a few micrometers and the aspect ratio exceeds 1000. The crystallographic structure was successfully elucidated by high-resolution electron microscopy. The surface of the nanostrands was remarkably positively charged and adsorbed an astonishing number of negatively charged dye molecules.

Cadmium hydroxide nanostrand has many unprecedented features that have not been observed in past fibrous metal oxides. It is noteworthy that double-stranded DNA of 6-kbp has a length of 2  $\mu\text{m}$  (1 bp = 0.34 nm) and a width of 2 nm. Cadmium hydroxide nanostrand has the same dimension with a short DNA chain. The nanostrand is a temporal object and eventually becomes a large hexagonal crystal, but the dilute solution is stable at least for a few weeks. It appears to be stabilized by the addition of amines or cationic polymers. Furthermore, the nanostrand quickly disappears by lowering the pH or adding chelate compounds such as EDTA. A remarkable affinity for organic molecules has not been seen for the past nanofibers with inert surfaces. Inorganic nanostrands spontaneously formed in water promise unique molecular functions we have not seen before.

