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**Battelle Number(s):**

14822, 15051

Patent(s) Issued

Available for licensing in all fields

Available Technologies

# Enzymes on Substrates: Exceptionally stable and highly active enzyme-coated fibers and carbon nanotubes

## SUMMARY

Various strategies for fabricating enzyme/carbon nanotube (CNT) hybrid materials have been developed and reported in the literature. However, the practical use of such materials has been hampered due to the short lifetime of enzyme activity. Presented here and available for licensing, are enzyme coatings on CNTs as a useful approach for the stabilization of enzyme activity.

The stable enzyme coatings are prepared by salting-out enzyme molecules in the presence of CNTs, followed by chemical cross linking between enzyme molecules on the CNT surface. The enzyme-coated CNTs also appeared to be highly active due to the increased enzyme loading in the form of multilayer coatings on the high-surface area CNTs. Further, the enzyme activity is shown to show no decrease over more than 220 days.

## ADVANTAGES

These exceptionally stable and highly active enzyme-coated CNTs may prove of utility, for example, in improving the performance of biosensors and biofuel cells.

## STATE OF DEVELOPMENT & AVAILABILITY

PNNL seeks qualified commercial partners to further develop this technology under license and offer commercial products for sale.



### Patents & Intellectual Property

- » Patent #: 7,611,835
- » Patent #: 7,611,878
- » Patent #: 7,838,273

### Technology Portfolio(s)

- » Materials Synthesis and Functionalization

### Potential Industry Applications

- » Chemicals

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