

Carbonic anhydrase immobilized on epoxy poss for CO₂ capture

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Bovine carbonic anhydrase (BCA) was immobilized onto encapsulated epoxy glycidyl POSS-functionalized SiO₂ nanoparticles and the product was synthesized and characterized. The enzymatic activities of the free BCA and SiO₂/EGPS-conjugated BCA were investigated by hydrolyzing p-nitrophenylacetate (p-NPA), CO₂ absorption rate enhanced by BCA on amine based solvents. The CO₂ absorption efficiency and reusability of the CA/SiO₂/EGPS were studied after recovered. Storage stability studies suggested that CA/SiO₂/EGPS retained nearly 82% of its activity after 20days. Absorbed CO₂ was monitored by Ion chromatography, which revealed the quantity of absorbed CO₂. The epoxy-immobilized BCA was shown to be an excellent promoter for the absorption of CO₂ in amine solvents.