Theoretical investigation of the cyclic reaction of NO$_2$ with CO mediated by ScO$^+$

Mechanism of the reaction of NO$_2$(i$\Delta g$) with CO($\Sigma$), mediated by ScO$^+$ on triplet and singlet electronic states has been investigated. TOFs of the reaction are found to be $1.2 \times 10^9$ s$^{-1}$ and $7.0 \times 10^{-25}$ s$^{-1}$ at 298 K for the triplet and singlet electronic states respectively. In comparison with $^1$ScO$^+$, $^3$ScO$^+$ has better catalytic function for the title reaction at the 298 K.

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Preparation, characterization and photocatalytic activity of cerium-doped titanium dioxide supported on activated carbon fiber composite

Higher degradation of methyl orange has been achieved with cerium-doped titanium dioxide supported on activated carbon fibers. The 0.20 mol% Ce-doped catalyst shows the highest photocatalytic activity.

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UV-A/solar light induced Fenton mineralization of Acid Red 1 using Fe modified bentonite composite

A novel heterogeneous bentonite based Fenton catalyst has been synthesized by solid state dispersion method and used for the degradation of Acid Red 1 dye under both UV and solar light. The catalyst was found to be stable, reusable and efficient over a wide pH range of 2–7. Though the dye degradation is 100% degradation at the optimum pH 3, it is also significant at pH 7 (69% under UV and 84% under solar light).

Synthesis of self-assembly of agarose-fatty acid ester nanoparticles

Microwave assisted facile synthesis and characterization of hydrophobically modified nanoparticulate agarose esters of stearic/palmitic acids, capable of forming self-assembly is described. DLS and TEM show the formation of 4–5 nm micelles and 220–250 nm polymeric vesicles in these new agarose based nanosize materials.
Ultrasonic investigation on segmental motion of some polymers in solution

The temperature of onset of segmental motion determined in some poly(amide ester)s in solution by a novel ultrasonic method is comparable to the glass transition temperatures determined for the solid samples by differential calorimetric method.

Notes

Preparation, characterization and study of transport of organic hydrocarbon vapours through EVA-organo modified Cloisite®15A nanocomposites

Nanocomposite membranes based on poly(ethylene-co-vinyl acetate) copolymer (18% vinyl acetate) and organo modified clay have been prepared by mechanical mixing by two roll mill method with dicumyl peroxide as the cross linking agent. The platelet-like morphology of silicates increases the tortuosity of path of solvent molecules through the nanofilled polymer samples.
Thorium phosphate, a cation exchanger synthesized by sol-gel method, exhibits promising ion exchange characteristics. Efficient metal ion separations carried out with this material indicates its high potential for use as a cation exchanger.

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