Hydrothermal sulfate for nitric oxide and formaldehyde. difference

Hydrothermalmethodology was used to synthesize the photocatalytic zinc sulfate microtubes. Ina typical procedure, 2mmol of SnCl4·5H2O and 4mmol of ZnSO4·7H2Owere dissolved into 35mL of deionized water to form two transparent solutions, respectively. The two solutions were mixed together, and then 2 g of celluloseacetate (CA) was added to the above mixture under vigorous magnetic stirringfor 10 min. Then 0. 5M NaOH solutions were added dropwise into the above mixedsolution until the pH of the suspension was adjusted to 10 under magneticstirring. Afterheating this suspension in an autoclave for 2 days at 220°C and allowing it tocool down, filtration was performed to separate the resulting precipitates. These precipitates were then subjected to washing and drying.

By using the samemethodology SnO2 as well as ZnO photocatalyst were also synthesized5. Measurement ofphotocatalytic activity by using continuous flow reactor and reverse phasecolumnIndoor airpollutantsDegradation offormaldehyde (HCHO) and nitric oxide (NO)Continuous flowreactor and reverse phase column was used to detect the photocatalytic activityof zinc sulfate for nitric oxide and formaldehyde. Difference in concentrationof pollutants in inlet and outlet stream estimates the degradation activity ofphotocatalyst. It has been shown in Fig.

6. that photocatalytic activity of Zn2SO4microtubes is higher than other photocatalyst used for drawing a comparison i. e. SnO2 as well as ZnO. As it can been seen from this plot the removalrate of NO by Zn2SO4 was 69. 9% as compare to 42.

1% by ZnOand 33. 9% by SnO2. The main reaction involved in oxidation of NO hasbeen given in following equations. Nitrous and nitric acid are formed as aresult of reaction between NO and reactive radicals16. NO + 4. OH NO2 + H2O NO2 + . OH NO3 + H+NO + NO2+ H2O 2HNO2NOX + . O2- NO3- Fig.

6. Plot betweem concentration of NO and irradiation time It has beenshown in Fig. 7.

that photocatalytic activity of Zn2SO4microtubes is higher than other photocatalyst used for drawing a comparisoni. e. SnO2 as well as ZnO. As it can been seen from this plot theremoval rate of HCHO by Zn2SO4 was 26. 4%. Photocatalyticoxidation of formaldehyde involves a chain reaction that is regulated byhydrogen peroxide, hydroxyl radicals and superoxide radical.

As a result ofthis reaction the product formed may be formic acid or carbon dioxide dependingupon the proportion of number of pollutant molecules adsorbed and holesgenerated. The main reaction involved in oxidation of HCHO has been given infollowing equations5, 17. HCHO + H2O + h+ HCHOOH + h+ (pollutant molecules adsorbed > holes) HCHO + H2O + h+ CO2 + h+ (pollutant molecules adsorbed < holes)