

601e Vanadia Catalyzed Vapor Phase Oxidation of Methanol in the Presence of Ozone

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Catalytic oxidation of methanol was carried out in the presence of ozone using vanadia based catalysts. The process can be used to selectively convert alcohols to aldehydes or ketones. It can also be used to control emissions of volatile organic compounds from Kraft mill and other sources. A series of vanadia based catalysts were prepared using sol-gel and impregnated procedures by varying the vanadia content. The catalysts bulk and surface composition is determined by XRD and SEM-EDAX, respectively. Active site densities are measured by redox-titrations using Micrometric sorption unit. The catalysts activity and stability was elucidated in vapor phase oxidation of methanol using ozone as oxidant. The result of the study reveals that vanadia content has significant influence on the activity and the optimum V/Ti ratio is found to be about 0.4. High turnover frequencies are observed over sol-gel catalysts. In absence of ozone the catalysts observed very low activity where as the ozone is directly influencing the V⁴⁺ and V⁵⁺ redox cycle of the catalyst. No catalyst deactivation was observed for 40 hours of operation. Attempt has been made to introduce the basic property by incorporating the Mg in sol-gel process