REMOVAL OF CH_3Br FROM VENT STREAMS BY CATALYSIS OR ADSORPTION-CATALYSIS

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Technologies are needed to eliminate methyl bromide emissions from quarantine and pre-shipment fumigation vent streams. Two strategies were employed here: catalyzed air oxidation (combustion) and adsorption-catalyzed degradation. For the first, mixed oxide CeO_2-MnO_x combustion catalysts were prepared *via* co-precipitation, redox precipitation, or sol-gel methods and tested in a fixed bed reactor. The sol-gel catalyst was superior, attributable to the greater concentration of high-oxidation-state Mn and Ce species on the surface. It gave 92.7% conversion of methyl bromide at 375 °C, and 100% at 400 ^oC, slightly out-performing the platinum catalyst we previously synthesized (1% Pt/30% CeO_2-Al_2O_3), but promising to be cheaper and less susceptible to catalyst poisoning. The second approach utilized carbon trapping followed by, or concurrent with, degradation catalyzed by redox or hydrolysis catalysts. Quantitative degradation was achieved within reasonable times at ambient-to-slightly elevated temperature.