

Degradation of Sulfur Mustard (HD) with Metal Oxides as Determined by Thermal Desorber

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Thermal decomposition of distilled sulfur mustard (2, 2'-dichlorodiethyl sulfide, HD) with metal oxides was investigated by employing thermal desorber. $Zr(OH)_4$, Al_2O_3 , Al_2CoO_4 , MgO , CeO_2 , and V_2O_5 are used as reactive adsorbents for HD degradation. Neat HD was spiked into glass tubes which were pre-filled with glass wool, metal oxides, and Teflon. Then, products of HD with metal oxides were thermally desorbed and subsequently analyzed by GC-MS. 1, 4-dithainae, 1, 4-oxathiane, and 2-chloroethyl vinyl sulfide are found as major products of thermal decomposition of HD in $Zr(OH)_4$, Al_2O_3 , Al_2CoO_4 , and CeO_2 . HD was not effectively degraded in MgO and V_2O_5 . Of particular note is $Zr(OH)_4$ and Al_2O_3 which showed enhanced reactivity toward HD.