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June 1, 2010

Combined CO2 mitigation and H2S removal

Gerald Ondrey

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Last month at the Global Refining Summit (Rotterdam, the Netherlands; May 17–19), Swapsol Corp. (Monmouth Junction, N.J.; www.swapsol.com) introduced a completely new sour-gas-cleanup process that reduces hydrogen sulfide levels below detectable levels (under 4 ppb) while reacting with carbon dioxide to form water, sulfur and a polymer of sulfur and carbon (carsul). Although still in the laboratory stage of development, the process promises to have application in cleaning up landfill gas, sour-gas, fluegas and Claus tailgas, as well as serving as an alternative to Claus technology, says COO Wolf Koch. Swapsol has applied for U.S. and international patents on all aspects of its technology.

Named after its discoverers, the Stenger-Wasap Process (SWAP) involves the reaction of H₂S and CO₂ at temperatures of 70–200°C and ambient to moderate pressures. The exothermic reaction is carried out in a catalyst-packed tubular reactor and produces sulfur, water and carsuls. The catalyst is a naturally occurring mineral ore that is pretreated in a manner analogous to common hydrotreating catalysts, says Koch. Sulfur can be recovered from carsul by simply heating it, leaving behind a polymer of carbon that may have applications as a construction material.

Thus far the company has performed the reaction in 1- and 2-in.-dia. tubular reactors, and believes scaleup to a commercial process with a large shell containing multiple tubes is not a problem. Swapsol is now planning to start testing its applications in a pilot plant during the 3rdQ of 2010, and move to the first commercial application — most probably a landfill-gas-cleanup operation — during 2011, says Koch.

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