Low Temperature Sorbents for Removal of Sulfur Compounds from Fluid Feed Streams

Opportunity

Although research is currently inactive on the patented technology "low temperature sorbents for removal of sulfur compounds from fluid feed streams," the technology is available for licensing from the U.S. Department of Energy's National Energy Technology Laboratory (NETL).

Overview

Disclosed in this patent is a process consisting of a material reactive with sulfur, a binder unreactive with sulfur, and an inert material that in combination can absorb sulfur from fluid feed gas streams at temperatures ranging between 30 and 200 degrees Centigrade. Research has shown that the sulfur absorption capacity has reached as high as 22 weight percent through the application of this process.

Although vapor-phase fuel streams provide valuable commodities, such as liquefied petroleum gases, these commodities cannot be commercially used until contaminants within them are removed. The most typical contaminants are sulfur-containing compounds, such as hydrogen sulfide and others. Removal of the sulfur is necessary to preserve the environment and protect components, such as catalysts, fuel cells, and turbines, contained in power generation systems. Some techniques currently exist for sulfur removal but are limited by only incorporating high temperature ranges. Low temperature processes for removing sulfur also exist but are limited by low sulfur capacities.

The NETL-developed technology provides a solid sorbent that removes sulfur compounds at low temperatures. The process operates at temperatures ranging between 30 degrees and 200 degrees Centigrade, while exhibiting the capacity to absorb high levels of sulfur. In addition, the sorbent itself is relatively inexpensive to manufacture and maintain. The process features a combination of readily available sulfur-reactive materials with diluents and support materials to produce a porous sulfur-absorbing substrate, resulting in the use of less materials and minimal costs.

Patent Details

U.S. Patent No. 6,743,405; issued: June 2004; titled "Low temperature sorbents for removal of sulfur compounds from fluid feed streams."

Inventor(s): Ranjani Siriwardane

Significance

Significance

- Removes sulfur compounds at low temperatures
- Increases sulfur-removing capacity
- Requires less sulfur-reacting materials
- Reduces cost by using less expensive sorbent to manufacture and maintain

Applications

- Power generation systems
- Natural gas and oil production processes
- Coal gasification and oil shale production

Contact

NETL Technology Transfer Group
techtransfer@netl.doe.gov