



Desulfurization of Hot Coal Gas

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Desulfurization Of Hot Coal Gas

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Desulfurization Of Hot Coal Gas:

Desulfurization of Hot Coal Gas Aysel T. Atimtay, Douglas P. Harrison, 2013-06-29 Economic and environmental requirements for advanced power generating systems demand the removal of corrosive and other sulfurous compounds from hot coal gas After a brief account of the world energy resources and an overview of clean coal technologies a review of regenerable metal oxide sorbents for cleaning the hot gas is provided Zinc oxide copper oxide calcium oxide manganese oxide based as well as supported and mixed metal oxide sorbents are treated Performance analysis of these sorbents effects of various parameters on the desulfurization efficiency kinetics of sulfidation and regeneration reactions sulfiding and regeneration mechanisms are discussed Two chapters present recent results in the direct production of elemental sulfur from regeneration or SO₂ rich gases

Desulfurization of Hot Coal-derived Fuel Gases with Manganese-based Regenerable Sorbents Rachid Ben Slimane, 1994 **Desulfurization of Hot Coal Gas in a Fluidized Bed with Regenerable Zinc Titanate Sorbents** Wahab Mojtahedi, Kari Salo, Javad Abbasian, Institute of Gas Technology, 1994

Hot Coal Gas Desulfurization with Manganese-based Sorbents, 1995 The primary major deposit of manganese in the US which can be readily mined by an in situ process is located in the Emily district of Minnesota The US Bureau of Mines Research Centers at both the Twin Cities and Salt Lake City have developed a process for extracting and refining manganese in the form of a high purity carbonate product This product has been formulated into pellets by a multi step process of drying calcination and induration to produce relatively high strength formulations which are capable of being used for hot fuel gas desulfurization These pellets which have been developed at the University of Minnesota under joint sponsorship of the US Department of Energy and the US Bureau of Mines appear superior to other more expensive formulations of zinc titanate and zinc ferrite which have previously been studied for multi cycle loading desulfurization and regeneration evolution of high strength SO₂ and restoration of pellet reactivity Although these other formulations have been under development for the past twelve years their prices still exceed 7 per pound If manganese pellets perform as predicted in fixed bed testing and if a significant number of utilities which burn high sulfur coals incorporate combined cycle gasification with hot coal gas desulfurization as a viable means of increasing conversion efficiencies then the potential market for manganese pellets may be as high as 200 000 tons per year at a price not less than 3 per pound This paper discusses the role of manganese pellets in the desulfurization process with respect to the integrated gasification combined cycle IGCC for power generation

High-Temperature H₂S Removal from IGCC Coarse Gas Jiang Wu, Dongjing Liu, Weiguo Zhou, Qizhen Liu, Yaji Huang, 2017-11-07 This book provides extensive information on high temperature H₂S removal for integrated gasification combined cycle IGCC coarse gas together with briefly introductions to the concept of clean coal technology and to the mechanism and kinetics of hot coal gas desulfurizers Readers will gain a comprehensive understanding of available control methods for high temperature H₂S removal in IGCC coarse gas and how the technology has been adopted by industry As

such the book offers a unique resource for researchers and engineers in the fields of energy science and technology environmental science and technology and chemical engineering Desulfurization of a Simulated Hot Coal Gas Using a Manganese-based Sorbent Kathleen Alison Joanna Sadecki,1997 *Syngas from Waste* Luis Puigjaner,2011-07-15 Syngas from Waste presents the most recent concepts methods and techniques for the preliminary design of a promising emerging technology production of clean syngas from waste materials An in depth account is given of the steps necessary to achieve the optimum design and up to date tools are presented to support the designer s decision making tasks modelling simulation and optimization Numerous illustrations and tables are included to facilitate the reader s understanding as well as suggestions for further reading The text is complemented with practical examples and industrial applications ranging from clean power generation to complex combined heat and power systems and high purity hydrogen for use in fuel cells Syngas from Waste contains high quality contributions from leading experts in the field It is intended for academics at MSc or PhD level researchers and industry practitioners in syngas production and applications who are involved in the design retrofit design and evaluation activities of alternative scenarios It contains valuable teaching material for lecturers and provides industry professionals with the know how to evaluate and improve existing installations or even to design a new one

Kinetics of Mn-based Sorbents for Hot Coal Gas Desulfurization ,1995 Fuel Cells: Technologies for Fuel Processing Dushyant Shekhawat,J.J. Spivey,David A Berry,2011-03-18 Fuel Cells Technologies for Fuel Processing provides an overview of the most important aspects of fuel reforming to the generally interested reader researcher technologist teacher student or engineer The topics covered include all aspects of fuel reforming fundamental chemistry different modes of reforming catalysts catalyst deactivation fuel desulfurization reaction engineering novel reforming concepts thermodynamics heat and mass transfer issues system design and recent research and development While no attempt is made to describe the fuel cell itself there is sufficient description of the fuel cell to show how it affects the fuel reformer By focusing on the fundamentals this book aims to be a source of information now and in the future By avoiding time sensitive information analysis e g economics it serves as a single source of information for scientists and engineers in fuel processing technology The material is presented in such a way that this book will serve as a reference for graduate level courses fuel cell developers and fuel cell researchers Chapters written by experts in each area Extensive bibliography supporting each chapter Detailed index Up to date diagrams and full colour illustrations **Pore Structure and Reactivity Changes in Hot Coal Gas Desulfurization Sorbents** ,1991 The primary objective of the project was the investigation of the pore structure and reactivity changes occurring in metal metal oxide sorbents used for desulfurization of hot coal gas during sulfidation and regeneration with particular emphasis placed on the effects of these changes on the sorptive capacity and efficiency of the sorbents Commercially available zinc oxide sorbents were used as model solids in our experimental investigation of the sulfidation and regeneration processes **Energy Research Abstracts** ,1993 Reactivity and Pore

Structure Changes in Hot Coal Gas Desulfurization Sorbents Evangelos A. Efthimiadis, 1991 **Hot Coal Gas Desulfurization with Manganese Based Sorbents. Quarterly Report, June-September 1994**, 1994 Central Illinois Public Service Company V. Allianz Underwriters Insurance Company, 1992 Hot Coal Gas Desulfurization with

Manganese-based Sorbents. Second [quarterly] Technical Report, December 1, 1992--March 1, 1993, 1993 At present the focus of work being performed on Hot Coal Gas Desulfurization is primarily in the use of zinc ferrite and zinc titanate sorbents however studies at the US Steel Fundamental Research Laboratories in Monroeville PA by E T Turkdogan indicate that an alternate sorbent manganese dioxide containing ore in mixture with alumina 75 wt % ore 25 wt % Al_2O_3 may be a preferable alternative to zinc based sorbents A significant domestic source of manganese in Minnesota is being explored for an in situ leach process which has potential for producing large tonnages of solutions which may be ideal for precipitation and recovery of pure manganese as a carbonate in a reactive form In the current program the following studies will be addressed Preparation of manganese sorbent pellets and characterization tests on pellets for strength and surface area analysis of the thermodynamics and kinetics of sulfur removal from hot fuel gases by individual sorbent pellets loading tests by thermogravimetric testing regeneration tests via TGA on individual sorbent pellets by oxidation and bench scale testing on sorbent beds in a two inch diameter reactor The developed information will be of value to METC in its determination of whether or not a manganese based regenerable sorbent holds real promise for sulfur cleanup of hot fuel gases This information is necessary prior to pilot scale testing leading to commercial development is undertaken **Molten Iron**

Oxysulfide as S Superior Sulfur Sorbent Shaolin Zhong, 1993 *Pore Structure and Reactivity Changes in Hot Coal Gas Desulfurization Sorbents. Final Report, September 1987--January 1991*, 1991 The primary objective of the project was the investigation of the pore structure and reactivity changes occurring in metal metal oxide sorbents used for desulfurization of hot coal gas during sulfidation and regeneration with particular emphasis placed on the effects of these changes on the sorptive capacity and efficiency of the sorbents Commercially available zinc oxide sorbents were used as model solids in our experimental investigation of the sulfidation and regeneration processes **Hot Coal Gas Desulfurization with**

Manganese-based Sorbents. Annual Report, September 1992--September 1993, 1993 The focus of work being performed on Hot Coal Gas Desulfurization at the Morgantown Energy Technology Center is primarily in the use of zinc ferrite and zinc titanate sorbents however prior studies at the US Steel Fundamental Research Laboratories in Monroeville PA by E T Turkdogan indicated that an alternate sorbent manganese dioxide containing ore in mixture with alumina 75 wt % ore 25 wt % Al_2O_3 may be a viable alternative to zinc based sorbents Manganese for example has a lower vapor pressure in the elemental state than zinc hence it is not as likely to undergo depletion from the sorbent surface upon loading and regeneration cycles Also manganese oxide is less readily reduced to the elemental state than iron hence the range of reduction potentials for oxygen is somewhat greater than for zinc ferrite In addition thermodynamic analysis of the

manganese oxygen sulfur system shows it to be less amenable to sulfation than zinc ferrite Potential also exists for utilization of manganese at higher temperatures than zinc ferrite or zinc titanate This Annual Topical Report documents progress in pelletizing and testing via thermo gravimetric analysis of individual pellet formulations of manganese ore alumina combinations and also manganese carbonate alumina with two binders dextrin and bentonite It includes the prior Quarterly Technical Reports which indicate that the manganese carbonate material being of higher purity than the manganese ore has a higher degree of sulfur capacity and more rapid absorption kinetics A 2 inch fixed bed reactor has been fabricated and is now ready for subjecting pellets to cyclic loading and regeneration *Method for Enhancing the Desulfurization of Hot Coal Gas in a Fluid-bed Coal Gasifier* ,1989 A process and apparatus for providing additional desulfurization of the hot gas produced in a fluid bed coal gasifier within the gasifier A fluid bed of iron oxide is located inside the gasifier above the gasification bed in a fluid bed coal gasifier in which in bed desulfurization by lime limestone takes place The product gases leave the gasification bed typically at 1600 degree to 1800 degree F and are partially quenched with water to 1000 degree to 1200 degree F before entering the iron oxide bed The iron oxide bed provides additional desulfurization beyond that provided by the lime limestone **Enhanced Sorbent Durability for Hot Coal Gas Desulfurization** M. C. Jha,M. T. Kepworth,L. K. Baltich,U.S. Department of Energy. Office of Fossil Energy. Morgantown Energy Technology Center,1986

Whispering the Strategies of Language: An Emotional Journey through **Desulfurization Of Hot Coal Gas**

In a digitally-driven earth where displays reign supreme and instant interaction drowns out the subtleties of language, the profound techniques and emotional subtleties concealed within words frequently get unheard. However, situated within the pages of **Desulfurization Of Hot Coal Gas** a charming fictional prize blinking with fresh feelings, lies an exceptional journey waiting to be undertaken. Written by a talented wordsmith, that charming opus encourages viewers on an introspective trip, gently unraveling the veiled truths and profound impact resonating within the cloth of each and every word. Within the mental depths with this poignant review, we can embark upon a sincere exploration of the book's primary subjects, dissect its fascinating publishing fashion, and yield to the strong resonance it evokes deep within the recesses of readers' hearts.

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Desulfurization Of Hot Coal Gas Introduction

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