

Application of Nanotechnology to Remove Mercury from Gas Streams

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Combustion of fossil fuel especially coal releases small amounts of mercury into the atmosphere. There are efforts to reduce the mercury emissions from combustion sources due to the concern that mercury being a toxic substance. About 810 metric tons of mercury is emitted from fossil fuel fired power plants per year across the world. Developing control technologies have been challenging mainly due to the cost and implications of new technologies on the byproducts. This research is focused to use natural fibers impregnated with metallic nanoparticles to capture the hard to control mercury vapor from gas streams. The metallic nanoparticles were incorporated in a filter media that provided enormous surface area for the mass transfer of the contaminant from gas stream to the filters. The laboratory and the field-testing showed consistently over 90 % efficiency for mercury in a coal fired power plant flue gas. Although, the test is conducted in a stack of a coal fired power plant the filter is capable of removing mercury from any gas streams containing mercury including oil and gas production and combustion operations.

Biography:

Dr. Kumar Ganesan is a Professor and the Head of the Environmental Engineering Department at Montana Tech. He has over 45 years of experience in the Environmental Engineering field. He earned his Ph.D. from Washington State University, Pullman, Washington State, USA. His MSc (Engg) degree is in Public Health Engineering and the BE degree is in Civil Engineering, both from the University of Madras, India. Dr. Ganesan's research in the past ten years included mercury pollution in air, soils and water. He has developed and patented a metallic filter to remove mercury from air streams including coal-fired power plants. He is an editor of one textbook "Toxics in Air" and co-author of three text books, Pollution Prevention (Two editions) and Unit Operations in Environmental Engineering. He is also the author of an "Air Pollution Chapter" in an upcoming Environmental Engineering Handbook. He has received multiple awards from Regional, National and International professional organizations for his achievements in the field of Environmental Engineering.