

Could nanotechnology revolutionize natural gas industry?

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Nanotechnology could revolutionize the natural gas industry across the whole lifecycle from extraction to pollution reduction or be an enormous missed opportunity, claim two industry experts writing in *Inderscience's International Journal of Nanotechnology*. They suggest that nanotechnology could help us extract more fuel and feedstock hydrocarbons from dwindling resources. However, industry inertia and a lack of awareness of the benefits could mean a missed opportunity.

According to Saeid Mokhatab and Brian Towler of the Chemical and Petroleum Engineering Department, at the University of Wyoming, in Laramie, there are many opportunities for the industry to exploit nanotechnology. However, there is a traditional lack of innovation in the exploration and production sector, a perception of high costs, new risks, and a general lack of awareness of the benefits of nanotechnology.

The researchers have now described the potential benefits of nanotechnology, which could change that perception. Mokhatab and Towler point out that nanomaterials, such as nanotubes or engineered porous minerals, might be used in the gas field or other source to improve the efficiency of extraction of a wide variety of hydrocarbon fuel compounds and chemical feedstocks.

Similarly, related nanomaterials might be used to improve purification and storage of hydrocarbons, while yet other nanomaterials might be used in environmental remediation, allowing contaminated sites to be cleaned up of harmful pollutants. Nanomaterials might even be

developed as corrosion inhibitors for equipment and at the same time, more sophisticated nanotechnology could be developed as solid-state gas sensors for air pollution monitoring.

"The past decade has seen explosive growth worldwide in the synthesis and study of a wide range of nanostructured materials, the building blocks of nanotechnology," the researchers explain, "Investigations of mechanical, chemical, electrical, magnetic, and optical behavior of nanostructured materials have demonstrated the possibilities to engineer the properties of these new materials for a wide range of applications."

The researchers add that as readily accessible hydrocarbon reserves become depleted, the oil and gas exploration and production industry faces increasing technical challenges. These challenges boil down to increased costs and limitations on drilling and production technologies.

Source: Inderscience Publishers

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