Tiny tools for a big industry

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Even with technological advances in recent years, the petroleum industry still struggles to squeeze as much oil and gas as possible out of underground reservoirs. Now the big industry is looking to nanotechnology to boost efficiency. According to an article in *Chemical & Engineering News*, the weekly newsmagazine of the American Chemical Society, the tiny particles could help pinpoint oil pockets, monitor underground conditions and extract more trapped oil.

Renewable energy sources are gaining ground, but the world still uses 100 million barrels of oil per day, Senior Correspondent Mitch Jacoby writes. The petroleum industry is looking for ways to slake this thirst that are economical and environmentally friendly. But sucking up viscous oil through thousands of meters of packed rock and soil isn't easy. So some oil companies are exploring the use of nanomaterials, whose tiny dimensions allow them to slip into underground cracks and crevices and perform useful jobs.

One possible application is using nanoparticles as tiny scouts that report the subterranean paths oil takes from injection wells, where pressurized water is forced underground, to production wells, where the oil is pumped up and out. This information could help engineers map connectivity between wells and optimize injection schemes. Researchers have also developed miniature electronic data recorders to collect detailed information on pressure, temperature and other parameters that could help identify oil-rich spots. Other potential roles for nanomaterials include keeping oilfield surfactants from sticking to rocks and magnetically separating oil microdroplets from the injection water.

More information: "Seeking to boost oil production, petroleum researchers turn to nanotech," cen.acs.org/energy/fossil-fuel … ion-petroleum/96/i40

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