New insights into costly destruction of subsurface petroleum

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Scientists are reporting an advance toward understanding and possibly combating a natural process that destroys billions of dollars worth of subsurface petroleum. Called biodegradation, it occurs as bacteria and other microbes metabolize, or feed on, organic compounds present in crude oil.

The microbes remove the most valuable hydrocarbon compounds and change the most valuable lighter crude oils into lower-value heavy oils, bitumen and tars. Less gasoline can be produced from these heavier oils, which also are expensive to pump out of the ground and contain undesirable amounts of sulfur and metals. Most of the world's known petroleum is biodegraded oil, especially the severely biodegraded giant Athabasca tar sands and the Orinoco bitumen in Canada and Venezuela, respectively.

Scientists have been trying to identify biodegradation-limiting nutrients - nutrients that are essential for growth of microbes in subsurface oil deposits. Reducing availability of those nutrients could slow the natural destruction of petroleum.

In the new research, University of Calgary researcher T. B. P. Oldenburg and colleagues conclude that nitrogen probably is not the limiting nutritional factor, as once believed. Their report, scheduled for the Sept. 20 issue of ACS' *Energy & Fuels* suggests that other essential microbial nutrients, such as phosphorous, are the limiting factors in the growth of biodegradation microbes.

Source: American Chemical Society