Fracking a Safer Way: A Novel Analysis of Potential Innocuous Alternatives for Chemical Compounds Currently Utilized in the Composition of Hydraulic Fracturing Fluids

Garcia, Roger

Hydraulic fracturing is one of the most emergent oil and natural gas extraction processes in the United States. This controversial process has been the center of a large environmental debate, as its substantial economic benefits are matched by its possible environmental risks. The purpose of the experiment is to determine whether or not four harmful components of the current hydraulic fracturing fluid composition can be replaced by four potential alternative ingredients. If so, this would provide evidence supporting the possibility of a clean fracturing fluid; one that can still function for hydraulic fracturing companies while ensuring the safety of the public. By examining the capabilities of four specific hydraulic fracturing fluid components: hydrochloric acid, methanol, ethylene glycol, and sodium dodecyl sulfate; four potential alternatives were determined. These were: acetic acid, honey, propylene glycol, and methylcellulose. The functional capabilities of these four alternatives were compared to their corresponding chemicals, and the results were analyzed. From experimentation, it was proven that three of the potential alternatives showed significant signs of being able to replace the currently used chemicals. Although acetic acid did not fare well against hydrochloric acid, honey, propylene glycol, and methylcellulose performed at either the same or an improved level compared to their corresponding chemicals in almost all trials. With these results, the path to a solution to the long environmental debate over fracking has been made clearer. A clean fracking fluid would eliminate the threat of contamination, while still allowing America to benefit from domestic oil and natural gas.

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