Reaction-driven cracking for hydrocarbon extraction, geothermal power generation, and CO2 capture & storage

Technology #cu12290

This technology is a system and method for reaction-driven hydraulic fracturing with non-toxic fluids.

Unmet Need: Hydraulic fracturing without the use of high-pressure, toxic fluids

Hydraulic fracturing, also known as fracking, is a technique used in the oil and gas industry to extract oil and natural gas trapped in tight rock pore spaces. A significant impediment to hydraulic fracturing is the potential environmental issues associated with the practice including seismicity, groundwater contamination, uncontrolled release of hydrocarbon gases to the surface, and surface contamination. As such, there is a need for methods that enable hydrocarbon extraction with reduced environmental and safety risks.

The Technology: Reaction-driven cracking utilizes non-toxic fluids to accomplish hydraulic fracturing

This technology uses common, non-toxic fluids for reaction-driven cracking to achieve hydraulic fracturing. Unlike current methods, which employ high-pressure toxic fluids that carry environmental and safety concerns, reaction-driven cracking uses precipitation reactions modeled after natural processes. By injecting two supersaturated fluids into separate wells, this technology induces the precipitation of natural minerals that stresses the surrounding area, leading to rock fracture. In addition to hydrocarbon extraction, this technology could also improve geothermal energy extraction and enable underground carbon capture and sequestration. In sum, this technology provides an ecofriendly, safe method for reaction-driven cracking that is applicable to both energy production and carbon storage.

A proposed drilling operation to assess the technology has international support and is currently raising funds.

Applications:

- Enhanced hydrocarbon recovery from rock formations
- Extraction of tight oil and gas
- CO2 capture and storage
- Geothermal energy extraction

**Advantages:**

- Uses non-toxic fluids that yield natural minerals
- Does not require high-pressure fluids
- Reduces monitoring and safety protocols
- Provides a means to accomplish carbon sequestration
- Provides potential for carbon offsets through carbon trading, improving economics of the hydraulic fracturing

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**Patent Information:**

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**Related Publications:**


**Tech Ventures Reference:**

- IR CU12290
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