Docket #: S13-493

Core holder for In Situ Fluid Analysis in Enhanced Oil Recovery Experiments

Engineers in Prof. Anthony Kovscek's laboratory have developed a patented, dual-function core holder apparatus that can be used in enhanced oil recovery (EOR) experiments to both saturate the core and perform spontaneous imbibition analysis. This feature eliminates positioning errors because the core samples remain in a single system through a series of experimental steps. In addition, using a single core holder enables non-destructive core testing as well as analysis of the effects of gravity. This technology could be used to develop new EOR techniques by validating computer simulations, particularly with X-ray CT imaging analysis that quantifies fluid saturations locally within the core.

Stage of Research
The inventors designed and fabricated the core holder and then used it in X-ray CT scanning experiments to demonstrate that gravity has the potential to improve oil recovery.

Applications

- **Enhanced oil recovery** - X-ray CT scanning analysis and other experiments to evaluate effectiveness of hydrocarbon recovery techniques in field and outcrop cores

Advantages

- **Minimizes experimental error** - using a single apparatus for both saturating the core and conducting X-ray CT imaging for in situ fluid distribution

experiments:
    - eliminates positioning errors
    - enables core-flood experiments without damaging the core (i.e., non-destructive imbibition experiments)
    - allows for testing multiple positions, for example, the effects of gravity can be investigated by mounting the core holder vertically instead of horizontally
- **Low cost apparatus** - core holder is relatively inexpensive and can be fabricated in a machine shop

Publications

- Alshehri, A. J. and A. R. Kovscek, "In-Situ Visualization of Multidimensional Imbibition in Dual Porosity Carbonates," *Society of Petroleum Engineers Journal*, 21(5) 1631-1642 (2016).

Patents

- Published Application: 20160077023
- Issued: 9,903,826 (USA)

Innovators

- Amar Alshehri
- Anthony Kovscek

Licensing Contact

Matthew Ryan

Licensing Manager

Email