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NANOSENSORS: AN IMPROVED TOOL FOR EFFICIENT RESERVOIR CHARACTERIZATION AND OIL EXPLORATION

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Nanosensors have recently attracted the oil and gas industries for acquiring a panoramic insight of the oil reservoirs. Such nanodevices are found to be advantageous as compared to the conventional mechanical, electrical and optical sensors used in reservoir characterisation and oil exploration. The indispensable need for developing sensing devices that work efficiently under high-pressure/high-temperature conditions of the reservoir has paved way for nanosensors. This new class of nanomaterials have overpowered the conventional sensing techniques. Conventional sensing techniques are incapable of acquiring data at a large distance from the injection point. Recent developments have shown that carbon and silicon based nanosensors can be used in reservoir characterization and hydrocarbon detection. Moreover nanosensors in combination with certain conventional monitoring systems are anticipated to substantially improve the imaging outcomes thereby assisting the oil and gas industries in tuning the oil recovery methods for profitable outputs. Nanosensors provide accurate 3D reservoir characterization and even slight improvement in the sensing capability of hydrocarbon detection and insitu chemical compostion will produce exponential benefits. This paper provides an overview of how nanosensors prove to be more efficient than the conventional sensing systems used for reservoir characterization and hydrocarbon detection by the oil and gas industries till now.

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