

Examining the Effect of Nano Technology on Increasing Utilization in Oil Tanks and Wells in Upstream Industries

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Abstract— The oil business needs strong and solid materials in practically all procedures. By making nano-scale materials, lighter, increasingly strong, and more vigorous gear than the present items can be created. Nanotechnology in the field of oil industry and its related enterprises, notwithstanding diminishing the ecological risks of this part and the plausibility of sparing from reaping of underground holds, will give the premise to the development of the nation's significant businesses. Oil and gas industry in Iran are quite a while and appreciated. From these huge assets, it has made an exceptional spot for the nation. The push to accomplish innovation and improve the status of these enterprises is something that ought to be given extraordinary consideration. Thus, the oil, gas and petrochemical ventures have not left a long way past the entrance of nanotechnology, and nanotechnology has additionally entered this territory.

Keywords— Strong, Products, Nano, Oil, Range.

1. Introduction

Nanotechnology has broken the limits of different sciences with its very own temperament, and has given ground to utilizing the outcomes, offices and devices everything being equal and teaches to improve the personal satisfaction. Activity of wells incorporates all exercises that lead To create, keep up and increment it. For this situation, it is conceivable to do tests required for wells and tasks for development (corrosiveness, cross section, blocking, observing of weight and release). Nanotechnology can assume a fundamental job in any of these divisions. The way in to this job is the adjustment in the structure of devices and materials utilized in this activity. Absolutely, the utilization of nanotechnology could encourage and speed up activities, and at last lead to an expansion underway from wells.

2. The role of nanotechnology in misusing oil wells

2.1 Supervising the status of the wells

One of the significant activities in the field of information assortment is the chronicle of precise data about the state of the cells, for example, weight, temperature and release at the head or at the base of the well. Guaranteeing the right working of the hardware is significant. Specialists at the Virginia University's Photonic Laboratory are creating explicit kinds of solid and reasonable sensors from optical filaments to quantify pressure, temperature, oil stream and acoustic waveforms in the cell. They are. These sensors are especially thought to be because of little size points of interest, invulnerability to electromagnetic obstruction, productivity in high weight and high temperatures, and troublesome situations. In particular, it is conceivable to supplant and supplant these sensors without meddling during the time spent delivering oil at a sensible expense. These days substitution and substitution of old sensors in oil chains has enormous expenses. New sensors as far as generation are entirely moderate and offer progressively precise estimations. It is normal that the innovation of these sensors will improve oil generation by giving precise and solid estimations and decreasing the dangers related with oil investigation and penetrating. The sensors are likewise specifically noteworthy because of their capacity to use in exceptional cases, for example, seaward and seaward oil extraction, where it is extremely hard to utilize old sensors in such circumstances.

2.2 Cross section work

The significant part is the consummation of a well, hooking the creation layer if necessary. This activity, in particular, the foundation of the connection between the generation layer and within the well, is completed by puncturing the fixing divider. These days, the cross-section in two layers: one by unique balls, which are tossed by a particular strategy from the a ways into its metal divider (at the ideal profundity), and the other by a metal shooting star that utilizations black powder. The working technique is nearly the equivalent and just the sort of shots are extraordinary. These days, metal shooting star tasks are normally utilized, in which two diverse metal and touchy materials are utilized to create enough power. It relies upon the kind of explosives, the state of the slug, the sort of stone, and so forth. With a lattice, a channel, a packaging or concrete behind it, just as a piece of the layer. Then they get into the gap, at that point oil or gas moves through the well into the well. Late advancements in the surface building utilizing savvy coatings and covering advances, rubbing and scraped spots are accessible available. The surface is better constrained by the assimilation of sulfur and phosphorus, which decreases consistency and upgrades thickness in liquid. As of late, an assortment of nanostructure coatings has been made of clay and mental stages. The coatings have a multi-useful ability due to their nanostructure and consistency all through the covering. Notwithstanding high hardness, low grinding coefficient, these coatings have high electrical or warm conductivity properties.

2.3 Concrete work

The exact cementitious work of concrete funnels is of specific significance in penetrating tasks, as it were, if the broke quality is low, there will be issues at the hour of generation from the well. Concrete funnels are clung to the mass of the well with concrete. In this procedure, first, the interconnecting pipes are associated with one another and headed to the base of the well. At that point, the concrete is siphoned from the base of the well to the rear of the cylinders (the space between the cylinders and the wells of the well) and comes up to the outside of the earth. The sort of storage utilized for the activity relies upon the kind of activity and the state of the wells and layers. Concrete ought to have properties, for example, it is capacity to pumice, legitimate consistency and extreme hardness. The above properties can be gotten utilizing nano-fats. The nanoparticles are added to the concrete because of the properties of the quantum mica and the mass of the material, bringing about its appropriate quality. One of the clearest properties of these particles is that, after the expansion, the entire blend is uniform and therefore the consistency of the properties of the concrete.

3. The Interaction between oil extraction utilizing nanotechnology

The procedure of investigation of oil fields is declining and many oil supplies are toward the finish of their creation period. The significance of improving and improving the expulsion techniques is that in the vast majority of the world's oil stores, around 66% of the oil's repository stays unblemished and can not be evacuated utilizing traditional strategies. The nearness of nanotechnology in this part can prompt expanded proficiency. Energy tanks help.

4. Warmth protection and hostile to an erosion of nano-structures with a fluid covering

The exceptional component of this item is its smoothness, which enables it to be utilized on metal and non-metallic surfaces by gun, brush and paint rolls. Likewise, in nanoscale particles, these coatings cause the most entries in the surface holes, which are secured by the covering, and on the grounds that the molecule

size of these coatings is in the fight, both from space and materials to the right sum was utilized. Likewise, the thickness of these slim layers is low to the point that the porosity is low and the variables that cause consumption additionally cannot enter these layers. Moreover, the attachment of this sort of covering to the objective material is awesome and the covering quality is high, and as a result of the uniform appropriation of the covering, the flimsy layer scattering takes out the potential contrast and disposes of the main impetus to begin consumption.

5. Lessening Nano Contamination by Oil Production

Contamination by synthetic compounds or poisons is an exceptionally troublesome theme in oil and gas creation. The aftereffects of research from researchers recommend that nanotechnology can help lessen contamination in a palatable manner. At present, channels and particles with a nanoscale structure are being built up that can isolate natural mixes from the fume. In spite of the way that they are around a couple of nanometers in size, they have a wide outside surface and can control the sort of liquid that goes through them. Likewise, nanostructured impetuses are utilized to encourage the partition of hydrogen sulfide, water, carbon monoxide, and carbon dioxide from petroleum gas in the oil business. At present, contemplates have been completed on tests of the earth in nano measurements and in a mix with polymers that can ingest hydrocarbons. Accordingly, it is conceivable to isolate oil buildups from boring mud.

6. Improve oil extraction utilizing nano sensors

Because of the high temperature and weight in outrageous conditions underground, Sensors old electrical and electronic and different enterprises estimated dependably are not and, in this way, mining organizations shows the oil in the planning of the important data and touchy to extricate the full and compelling oil from the tanks of nano-sensors use. Nano sensors are exceptionally practical regarding the generation and give increasingly exact estimations. It is normal that the innovation of these nano sensors will improve oil creation by giving exact and solid estimations and diminishing the dangers related to oil investigation and penetrating. Additionally, these nano sensors are quite compelling because of some uncommon applications, for example, marine and even oil extraction, where the utilization of old sensors is troublesome in such circumstances.

7. Increasingly subjective seismicity utilizing nano sensors

One of the utilizations of nanotechnology in the oil and gas industry is its utilization in concealing printing. Seismic tasks are performed by uncommon gadgets by impacting in various areas on the ground and afterward recording the power and abundancy of the seismic made. From the seismic information, it tends to be gotten: the general structure of the layers of the earth, the repository go, the kind of liquid (gas, water or oil, and so forth.). Getting data in seismic tasks is finished by explicit sensors. It appears that by making nano sensors the seismic account should be possible all the more correctly in light of the fact that it is conceivable to enter these sensors in various layers of the earth and record seismic in different circumstances. Nanotechnology can, notwithstanding the improvement of the nanostructures of geophones (little seismographs), lead to quicker execution and increasingly precise voice recording on the ground. The utilization of nanotechnology in apparatuses for the investigation of oil and gas can get progressively precise data, and particularly the securing of data from tremendous profundities and, thus, increasingly complete information on repositories.

8. High accuracy mapping utilizing nano sensors

Nano sensors are utilized absolutely for breaking down bars, because of their significant level of utilization. Notwithstanding these capacities, these nano sensors will have the undertaking of deciding the layers' appearance and guaranteeing liquid properties. These sensors are profoundly respected in the oil business because of favorable circumstances, for example, little size, insusceptibility to electromagnetic obstruction, high weight, and high-temperature execution, and extreme situations. As we stated, nano sensors are very financially savvy regarding creation.

9. Creation in penetrating utilizing nano

By lessening the assets accessible to the oil and gas investigation and creation industry because of expanded operational profundity, the dangers and issues related with sub-surface topography with expanding profundity, flat movement to accomplish greatest generation, the multifaceted nature of penetrating tasks and the state of the wellhead or the quantity of branches Output from the primary mouth to accomplish most extreme contact with the tank has confronted difficulties. In all procedures of oil and gas penetrating, strong and dependable materials are required. By making nanoscale materials, lighter, more solid and more hearty hardware than current items could be delivered. Two significant employments of nanotechnology in penetrating activities are the development of liquids and boring apparatuses that will be alluded to underneath.

10. Ultra-safe boring gear utilizing nano

The best pressure during boring activities enters boring drills. Boring apparatus is a piece of the burrowing field that is continually dissolving and subsequent to burrowing a checked region, they lose their effectiveness and ought to be supplanted. New materials that make the drill progressively impervious to consumption and disintegration are exceptionally helpful in this area. Hence, nanostructures and carbon nanotubes can be utilized to create tough and strong boring tools utilizing nanocomposites. Likewise, utilizing manufactured nano diamonds can enormously build penetrating productivity.

11. Improve penetrating productivity utilizing nano

Penetrating mud assumes a significant job in quickening or deferring boring tasks. Penetrating mud is a liquid siphoned from the drill funnel to the base, originates from drill gaps, and afterward conveys boring logs from the round space between the dividers of the well and drill pipes. This liquid has numerous capacities in boring tasks, for example, boring smashers, cool boring apparatus, avoiding divider wells, divider pressure control, and water-driven siphon move to boring tools without which boring activities are conceivable. Not adequate. Properties, for example, water-powered power transferability and compressibility are among the most significant elements that can be accomplished utilizing nanocomposites, carbon nanotubes, and some hard-wired artistic nano powders with a particular gravity, (for example, carbide nano powders). The boring mud ought to have properties, for example, the thickness of the boring tool to the top, just as the capacity to move water-powered capacity to the siphons. Procure the properties required in boring mud by including certain synthetic substances, for example, polymers, weighers, and others. . . It is conceivable. It is conceivable to get properties, for example, the correct thickness utilizing nano-fats. Reasonable thickness is additionally accomplished by including greasing up oil-based nano-oils. Properties, for example, water-driven power

transferability and compressibility are among the most significant elements that can be accomplished utilizing nanocomposites, carbon nanotubes, and some hard-wired clay nanopowders with a particular gravity, (for example, carbide nanopowders). The thixotropic properties of a penetrating mud can likewise be accomplished with nano added substances. On the off chance that penetrating tasks were probably going to be removed, the blooms ought to be in a coagulated structure, averting the burrowing of the drill, and anticipate the diving device from getting into the well. Additionally, thick blooms ought to have the option to flush with the coagulated state with negligible pressure and again to reestablish the thixotropic properties of the blossom. In this area, the utilization of nanomaterials significantly affects improving these properties.

12. Connection of Nanoparticles with Oil Extraction

Polymer-covered nanoparticles can be utilized to recognize raw petroleum in develop oilfields, as indicated by researchers in the United States and China. Given that it is assessed that just around 60 percent of the raw petroleum is collected to developing oilfields, it appears to be likely that the rest of being distinguished as a generally undiscovered asset. Presently, James Tour and his associates at Rice University and the University of Nanjing, China, have planned nanoparticles to recognize unrefined petroleum hydrocarbons among the stones in these oilfields. These nanoparticles move among the stones and, when they discover unrefined petroleum, they leave their payload. The nanoparticles of these specialists incorporate carbon oxide cores, covered with polyvinyl liquor shells. These nanoparticles can pass on the hydrographic (or waterproof) organization called the nanoscale, all through these stones. Visit says: It's truly energizing to feel that we can construct nano-mill operators that can relocate crosswise over raw petroleum fields. These nanoparticles, when they contact with unrefined containing rocks, discharge their payload and can be seen by reusing them.

13. Development of overwhelming fuel tanks utilizing nano

Substantial oil is a piece of a noteworthy oil asset, which remains to a great extent flawless because of extraction issues because of high thickness. At present, extraction of substantial oil stores is completed utilizing warm recuperation techniques, CHOPS, infusion of dissolvable and infusion of vaporous blends. In this paper, the upsides of three separate procedures including warm techniques, dissolvable infusion, and intermixing gas infusion are joined and another procedure is proposed to diminish the consistency of substantial oil. In this investigation, metal nanoparticles were utilized to expand the warm conductivity of supercritical carbon dioxide or thick seepage liquid (VRI) to diminish the thickness of overwhelming oil. A super-basic superoxide dissolvable surfactant has likewise been added to the blend to upgrade this consistency decrease. Along these lines, the warm properties of metallic nanoparticles, the synthetic properties and solvency of surfactants, and the supercritical carbon dioxide and goey doping liquid blending properties, all add to diminishing the thickness of overwhelming oil and encourage the extraction of this sort of oil. Substantial or super-overwhelming oil alludes to raw petroleum that doesn't stream effectively. The purpose behind utilizing "overwhelming" for this kind of oil is its high thickness contrasted and light oil. Ordinarily, overwhelming oil with an API level of under 20 (or, at the end of the day, a general thickness of more than 933). Creation, move, and refining of overwhelming oil are more troublesome than light oil. The world's biggest overwhelming oil repository is situated in northern Venezuela. Be that as it may, when all is said in done, above twelve nations have substantial oil tanks. The high thickness and relative thickness, just as the heavier sub-atomic structure of this sort of raw petroleum, are the most significant physical properties that compensate for any shortfall between overwhelming oil and light. Venezuela's ultra-substantial oil has a consistency of more than 10,000 centimeters and an API level of 10. Normally, for the exchange of this kind of unrefined at determined interims, pipelines are utilized from diluents that encourage liquid stream.

Generation techniques from overwhelming and too substantial fuel tanks incorporate

- a) Cold overwhelming oil creation with sand
- b) steam helped gravity seepage
- c) cyclic steam incitement
- d) fume extraction

The consistency of substantial oil. A super-basic superoxide solvent surfactant has likewise been added to the blend to improve this consistency decrease. Along these lines, the warm properties of metallic nanoparticles, the compound properties and dissolvability of surfactants, and the supercritical carbon dioxide and gooey doping liquid blending properties, all add to diminishing the consistency of substantial oil and encourage the extraction of this kind of oil. Substantial or super-overwhelming oil alludes to raw petroleum that doesn't stream effectively. The purpose behind utilizing "substantial" for this kind of oil is its high thickness contrasted and light oil. Normally, overwhelming oil with an API level of under 20 (or, as it were, an overall thickness of more than 933). Generation, move, and refining of substantial oil are more troublesome than light oil. The world's biggest overwhelming oil store is situated in northern Venezuela. Be that as it may, all in all, over twelve nations have substantial oil tanks. The high consistency and relative thickness, just as the heavier atomic piece of this sort of raw petroleum, are the most significant physical properties that compensate for any shortfall between overwhelming oil and light. Venezuela's ultra-overwhelming oil has a consistency of more than 10,000 centimeters and an API level of 10. Normally, for the exchange of this kind of rough at indicated interims, pipelines are utilized from diluents that encourage liquid stream.

East. As a rule, the aggregate sum of raw petroleum and gaseous petrol assets on the planet is assessed to associate with 6 trillion barrels of oil for each capita, which is multiple times the normal oil stores of the world. Likewise, as indicated by ponders, the aggregate sum of Iran's overwhelming oil saves is evaluated at 85 billion barrels. Regardless of the enormous volume of overwhelming and petroleum gas saves, creation from these vitality sources has not just detracted from ordinary unrefined petroleum holds and is utilizing customary advances. They are difficult to utilize. The nearness of high consistency and the high level of asphaltene and sap mixes in this hydrocarbon messes up the extraction, move, and preparing of overwhelming oil. Beginning harvest in a few overwhelming oils and bitumen tanks, which have better conditions, comes to up to 6% of the oil inland. Subsequently, the utilization of reusing techniques is by all accounts vital from the earliest starting point of the collecting of these sorts of stores.

The consistently expanding interest for oil and its items, and the decrease of flammable gas from light oil stockpiling tanks, and, then again, rising oil costs as of late has prompted expanding consideration regarding generation techniques from substantial and overwhelming oil tanks. As the assessments appear, Canada's substantial oil creation in a matter of seconds will surpass 1.2 million barrels for each day. In Venezuela, as per arranging, oil organizations intend to arrive at 600 BPD. The Chinese government is likewise wanting to expand its raw petroleum creation to 150,000 barrels every day in no time. This is even though in Iran because of the significant stores of substantial oil, because of the absence of applicable innovation move, the creation of overwhelming oil fields doesn't happen. Because of high thickness, substantial and overwhelming oil tanks are not surprising for introductory recuperation. Consequently, for proficient recuperation of such stores, it is important to decrease the thickness of the oil in situ by utilizing heat treatment, with the goal that more

than 80 percent of the generation of substantial oil. At the phase of extraction, the reaping is done utilizing warm techniques. As a rule, substantial and overwhelming oil tanks expect measures to lessen the thickness of oil and carry vitality into the supply. At the point when super-hot steam is infused into the store, the consistency of the oil diminishes, supply pressure increments through uprooting and incomplete refining of the oil. The steam can be ceaselessly infused into a repository as a flood or a consistent way and a multi-cycle. In the irregular mode, it is conceivable to infuse the steam from a well (in the job of the infusion well) into the repository and afterward to separate the oil from a similar well (this time in the job of the well). Gas infusion, either as an intermixing (which gas injection and oil inside the supply are intermixed with one another and structure a liquid), just as non-injectable (which cylinder gas infused into the repository prompts creation wells), are strategies for recuperation that are widely utilized after oil extraction techniques.

14. Conclusion

Considering the issues referenced in the article and the boundless utilization of nanoscale in the upstream enterprises, particularly in expanding oil generation, and its magnificent effect on expanding the take-up and use of this innovation for the upstream business, perceiving this innovation and how it is utilized for this huge industry is significant and with the coming of science, the extent of utilizing this important innovation is a lot more extensive.

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