Heavy metal removal from drilling fluid wastes: An Overview

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Abstract
Liquid drilling fluid is often called drilling mud is heavy, viscous fluid mixture use to carry rock cuttings to the surface and lubricate and cool the drill bit. During carrying cutting they contaminated which not only reduced their functionality but also make them a hazardous and dangerous wastes which cannot be discharged anywhere without treatment. Due to this fact, in the presents study, a brief account of recent developments and technical applicability of different treatment methods for heavy metal removal is reviewed with a particular focus on nanomaterial adsorbent for the drilling wastes treatment methods for heavy metal removal is reviewed with a particular focus on nanomaterial adsorbent for the drilling wastes treatment in oil and gas industry and include a case study in the region of azadegan formation. The challenges that face future trends of nanomaterial applications in the oil and gas drilling industry are also discussed.

Keyword: Drilling fluid, Nanomaterial, Adsorbent

1. Introduction
Crude oil and natural gas are fossil fuels that come from dead animals and plants which have been covered by layers of sedimentary rock, and heated under pressure in the absence of sir over millions of years. Crude oil is obtained from the earth crust and since oil and gas less dense than water, they rise to the top of porous rock layers. They may then become trapped below a layer of non-porous rock and the trapped gas or oil can only be obtained by drilling through the non-porous layer. Oil exploration, drilling, and extraction are the first phase or what the oil industry call the "upstream" phase in the long life cycle of oil [1].

The physical alteration of the environment from exploration, drilling, extraction, drilling, and extraction activities include deforestation, ecosystem destruction, chemical contamination of land and water, long-term harm to animal populations and human health amongst others. Oil exploration, drilling, and extraction activities involve the use of water-based muds(WBMs), oil-based muds(OBMs) and synthetic-based muds(SBMs) to:

- Cool and clean the bit
- Maintain pressure balance between the geological formation and the borehole
- Lubricate the bit
- Reduce friction in the borehole
- Seal permeable formations
- Stabilize the borehole and;
- Carry cuttings to the surface for disposal[2]

Water-based muds(WBMs) are by far the most commonly used mud, both onshore and offshore. They are widely used in shallow wells and shallower portions of deeper well, but are not very effective in deeper wells. The use of WBMs sometimes generate 7000 to 13000 bbl of