New Magnetite Nanoparticles Allow Smart Drilling Fluids with Superior Properties

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Abstract

This article, written by JPT Technology Editor Chris Carpenter, contains highlights of paper IPTC 18731, ñA Comprehensive Approach for the Development of New Magnetite Nanoparticles Giving Smart Drilling Fluids With Superior Properties for HP/HT Applications,ò by Z. Vryzas, Texas A&M University at Qatar; V. Zaspalis, Aristotle University of Thessaloniki; L. Nalbantian, Centre for Research and Technology Hellas; O. Mahmoud and H.A. Nasr-El-Din, Texas A&M University; and V.C. Kelessidis, Texas A&M University at Qatar, prepared for the 2016 International Petroleum Technology Conference, Bangkok, Thailand, 14ï16 November. The paper has not been peer reviewed. Copyright 2016 International Petroleum Technology Conference. Reproduced by permission.

This work focuses on using custom-made (CM) magnetite (Fe3O4) nanoparticles (NPs) to improve the properties of bentonite-based fluids. The microstructure qualities and modes of interaction have been identified, helping to optimize the rheological and fluid-loss properties of these drilling fluids. The better performance of the CM Fe3O4 NPs can be attributed to their extremely small size, which leads to stability in suspensions and effective linking with the bentonite particles, thus allowing the formation of a rigid microstructure network.

Journal of Petroleum Technology 2017, November

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