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A new interface detection method based on heat transfer rate of oil and water

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The detection of interface between water and oil is of great significance for the heavy oil exploitation. However, the existing detection techniques suffer from some problems such as low efficiency and poor accuracy. A new interface detecting method based on the heat transfer rate between oil and water is proposed. Heat transfer model and Heat transfer rate model which include heat conduction and heat convection have been established in the paper. Experiments of the thermal conductivity of oil and water were carried out under constant temperature condition and heat transfer rate was calculated by difference method Results shows that the heat transfer rate of water is much greater than that of heavy oil at different temperatures which are consistent with the proposed model, demonstrating that detection of oil-water interface position can be realized by measuring the difference of heat transfer rate between oil and water.

Biography

Zhang Guoying work in China University of Mining & Technology (Beijing) mechanical and electrical and information engineering college of computer science. She has published more than 40 academic papers and published academic works. She got the seven patents of invention as the first inventor.

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