

过程系统工程

基于模式分类的油水混合物含水率测量方法

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摘要

为了提高原油脱水过程中含水率测量的精度和量程, 提出了油水混合物多模态的电特性计算方法。通过分析油水混合物的不同存在模式, 采用有限元法计算不同模态油水混合物的介电常数、电导率与原油含水率之间的关系, 并通过自组织人工神经网络实现了油水混合物的模式分类。实验结果表明, 通过计算介电常数和电导率可以识别油水混合物的不同模态, 及时修正含水分析仪的设置参数, 有效地提高了原油含水率在线测量的精确度。

关键词

[介电常数](#) [电导率](#) [人工神经网络](#) [原油含水率](#)

分类号

Measurement of water-oil ratio in crude oil based on modes classification

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Abstract

In order to improve measurement accuracy and widen measurement range for water content in crude oil, a computation method based on the electrical measurement of multiple modes was proposed in this paper. By the study of oil-water mixture, it could be mainly classified into four different modes. The relationship between water content in crude oil and permittivity as well as conductivity for the different modes can be established by using the FEA (finite element analysis) method, and the different states will be accurately recognized based on self-organizing neural network. The experimental results demonstrated that the different modes of oil-water mixture can be identified by computing the permittivity and conductivity. Therefore, the on-line measurement accuracy and range of the water content in crude oil can be improved effectively.

Key words

[dielectric permittivity](#) [conductivity](#) [self-organizing neural network](#) [water content in crude oil](#)

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