

On-line Monitoring of Transformer Oil Degradation Based on Fiber Optic Sensors

Tae-Young Kim*, Jong-Eun Kim and Kwang S. Suh

Department of Materials Science and Engineering, Korea University
5-1 Anam-dong, Seongbuk-gu, Seoul 137-713, Korea

(received July 25, 2007; accepted July 16, 2008)

Key words: fiber optic sensors, acoustic monitoring, insulating oil, degradation

In this paper, we present the preliminary results of our study on the use of a fiber optic sensor as a diagnostic and monitoring tool for evaluating the condition of transformer oil. An all-optical-fiber sensing system using a Mach-Zehnder interferometry technique was constructed to monitor acoustic wave propagation properties in differently aged transformer oil. It was found that the measured sound attenuation in the oil varies as it degrades, suggesting that the observation of sound attenuation with the fiber optic sensor can indicate the condition of service-aged transformer oil.

*Corresponding author: e-mail: thomas75@korea.ac.kr