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Development of micro engine oil condition sensor using multi-wall carbon nanotube films DAE SEOK NA, Optoelectronic Materials Research Center, Korea Institute of Science Technology, Seoul 136-791, JAMES JUNG-HO PAK, Department of Electrical Engineering, Korea University, Seoul 136-701, Korea, JAI KYEONG KIM, Optoelectronic Materials Research Center, Korea Institute of Science Technology, Seoul 136-791, Korea — A new interdigit-type micro oil condition sensor was designed and fabricated for monitoring the deterioration of lubricating and insulating oils. The designed sensor operates based on the change of the dielectric constant and electrical conductivity. In order to improve sensor performance, an oil condition sensor was fabricated using MEMS technology and multi-wall carbon nanotube film. The experiment was performed with automobile engine oils with the same brand and quality so as to ensure measurement reliability. Capacitance changes were measured according to increasing mileage and the sensors' performance was improved. These results show that the proposed sensor could measure the degree of oil deterioration with a high sensitivity and it is applicable to other lubricating systems as well as insulating systems.

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