Classification of Lubricant Oil Geometrical Odor-Profile using Cased-based Reasoning

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Abstract:
The Lubricant oil is one of the petroleum refinery product. The lubricant oil usage is very important in order to make sure the operation of vehicle engine at the highest performance. In determining the lubricant oil adulteration level, there were so many method of classification using various instrument such as ICP-MS, AAS and Dielectric Spectroscopy. E-nose is one of the significant instrument using odor approach to classify the odor of the sample. The purpose of this study is to classify the lubricant oil degradation level based on odor-pattern that extracted from the odor data that collected using electronic nose. The lubricant oil sample consist of 4 level of lubricant oil adulteration level which are virgin lube oil, 3000KM, 7000KM and 10000KM lubricant oil sample. Pre-processing technique were applied by implementing normalization formulation in order to standardize the odor raw data. Normalized data very beneficial in features extraction process, so that the significant odor-patterns can be established. In this study, geometry average calculation method was applied in order to establish the odor-profile for lubricant oil sample. The odor-pattern then were classified using case-based reasoning classifier. Based on the classification results, it shows that the accuracy of the classification is100% correct classification.

Keywords : E-Nose; Lubricant Oil; Geometric Mean; Odor-Features; Case-Based Reasoning.

Acknowledgment