

Abstract

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Ageing behaviour of engine oils in passenger cars

Oil condition monitoring of engine oils is common practice in the maintenance programme of large engines, where the optimisation of oil drain intervals has gained technical and economical importance. In the case of passenger cars, where small oil fillings are used, condition monitoring also in combination with chemometrics, is not well established.

In 2007, AC²T started a fleet test involving 24 passenger cars in everyday use. Oil ageing was monitored periodically by oil sampling and analysis comprising among others viscosity, total base number, elemental analysis and infrared spectrometry.

Characterisation of oil ageing mechanisms with respect to different operating parameters is realized using chemometric methods.

In this paper, qualitative evaluation by principal component analysis (PCA) is discussed. Current results show the potential of PCA to assess different factors influencing an oil's condition such as fuel, engine type and composition of preceding oil fillings. PCA plots as basement for all kinds of subsequent multivariate regression models indicate that the variety of different engines combined with the varying and irregular operating conditions significantly determine the quality of regression models.