

Forensic Analysis of Lubricants

REFERENCE: Hirz R: Forensic analysis of lubricants; *Forensic Sci Rev* 3:91–99; 1991.

ABSTRACT: Lubricants are found everywhere as a matter of course, and thus would also likely be found at the scene of a crime. Many fields of applications for lubricants exist and numerous formulations can be used within a single field. In addition, the composition of a lubricant changes significantly during its use. These facts are an illustration that lubricants, especially those that have been used, will have features that may possess high evidential value. Most studies on lubricants deal with wear monitoring, monitoring of the degradation of lubricants, and chemical analysis of the base oil and additives. The methods used require sample sizes in the range of 0.5 g and can give an indication of the brand and its application. In contrast, the studies dealing with forensic problems utilize spectroscopic methods that require sample sizes in the microgram range, and can only compare samples. Their main drawback is that the sample matrix may have an adverse effect on the analysis. Analyses using a combination of chromatographic and spectroscopic methods for the detection of special compound classes require more sample but are not as affected by the matrix. Using the methods reviewed here, the forensic scientist may be able to identify the brand and application if the sample size exceeds 0.5 g or may compare samples if the size is very low.

KEY WORDS: Analysis, lubricants.