

Determination of Total Polar Material in Frying Oil by Using Accelerated Solvent Extractor (ASE)

Zainal and Isengard, University of Hohenheim

Stuttgart, Germany

During usage, frying oils undergo deterioration by various chemical reactions, such as oxidative, hydrolytic and thermal reactions. By these reactions compounds are formed that are more polar than triglycerides, called total materials (TPM). The TPM is one of the indicators for monitoring the oil quality. Some countries have regulations for allowable TPM values in frying oils, usually in the range of 24 to 30%. Official methods for determining TPM exist. They are based on preparative column chromatography, one using a big column whereas the other using a micro column. They separate the oil in two fractions, a polar and a non-polar one. Both methods require much time to yield a result. Another possibility to separate these fractions is the use of accelerated solvent extraction (ASE) which is originally used for fat extraction. The sample is placed in an extraction cell and the solvent pumped through it. The main principle of ASE is almost the same as for the big column method. The method was evaluated for refined high-oleic sunflower oil in which various plant product had been fried. The method was also compared to the results obtained by High Performance Liquid Chromatography. It can be concluded that ASE can also be applied for TPM determination in frying oils. The results are obtained in shorter time and sample preparation is not complicated. Thus, ASE is a valuable alternative to the chromatography technique.