Chemistry Seminar

Analysis of Flavor Compounds in Wine using

Stir Bar Sorptive Extraction (SBSE)

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Abstract: The analysis of flavor compounds in beverages such as coffee, tea, soft drinks, and alcoholic beverages usually requires cumbersome sample preparation steps. These processes include but are not limited to liquid-liquid extraction, solid phase extraction, and distillation techniques, often with the drawback of organic solvent use. Head space and purge& trap methods although better and do not use organic solvents have an analytic range restricted to volatile compounds and therefore characterize compounds that contribute to the aroma and smell of a sample but not flavor and taste. A new extraction technique, Stir Bar Sorptive Extraction (SBSE) can overcome the major problems with classical extraction techniques. With this technique a small stir bar (10-20nm length, 1.3mm OD) is coated with polydimethylsiloxane (PDMS). The stir bar is then placed directly in the sample and stirred. During this time analytes are extracted into the PDMS phase which acts as an immobilized liquid phase. The stir bar is removed rinsed with distilled water and placed into a thermal desorption unit. Due to the hydrophobic character of PDMS a drying step is not necessary. Heating stir bar releases extracted compounds into a GCMS system for subsequent analysis with very low detection limits (part per trillion).