Box 12: Pre-concentration of analytes in organic solvents

After extraction of analytes out of an environmental sample into an organic solvent, or after elution of analytes from a sorbent with a solvent, it may be required to reduce the volume of an organic solvent to further concentrate the contained analyte. For large volumes, a rota-vapor is typically used. In this apparatus, the solvent containing the analyte is rotated under vacuum at or above room temperature. The solvent successively evaporates and is trapped by condensation in a separate area of lower temperature (i.e., a cold trap). Rotavaporization is conducted until the desired final volume is obtained. For many organic analytes, care should be taken not to evaporate to complete dryness, as this would strongly increase the risk of analyte losses and hence would diminish reproducibility. If the final volume is required to be smaller than 0.5 mL, the organic solvent is preferably removed by the gas stream method. Here, the sample is transferred to small vials over which a constant stream of highly pure air, N_2 or He is passed. Note that solvent removal may not be the method of choice for 'highly volatile analytes' (i.e., to be more accurate: analytes with a high solvent/air partition constant), as these might be lost from the sample during preparation.

See also Problem 3

Download this page as a pdf