



## **Integration of Sampling with Sample Preparation as a Green Strategy in Analytical Chemistry)**

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Simplification and miniaturization as well as integration of the individual steps in analytical process are the most significant challenges to, and opportunities for, the contemporary analytical chemist focusing on on-site and in-vivo determinations to facilitate Green Analytical Chemistry. These developments will eventually enable attainment of a major goal of the analytical chemist—to perform analysis at the place where the sample is taken, rather than moving the sample to a laboratory, as is traditional, reducing errors and the time associated with sample transport and storage, leading to more accurate, precise, and faster analytical data. To allow multicomponent determination the instrumentation should incorporate well integrated separation and/or selective quantification steps. Recent trend in analytical instrumentation towards miniaturization results in portability and on-site compatibility facilitating this objective. Incorporation of the sampling and sample preparation steps in the miniaturized devices with the other steps of the analytical process can be accomplished in two fundamentally different ways. First, analogous to flow injection analysis, sample preparation may be performed directly in the capillaries/micro channels in the flowing systems. Membrane sampling interfaced to an investigated system could facilitate sampling, as is currently performed in membrane extraction with sorbent interface (MESI) coupled to micro gas chromatography. The alternative approach involves integration of sampling with sample preparation only, by performing extraction and sample processing directly in the sampling device followed by on-site introduction to a microseparation/quantification instrument.

**Keywords:** Green Analytical Chemistry, integration, on-site instrumentation, membrane extraction, SPME, Needle Trap.

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