

USE OF SURFACE ENHANCED RAMAN SPECTROSCOPY (SERS) IN BIOANALYTICAL CHEMISTRY

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Raman spectroscopy is an analytical method that offers several important advantages. This technique provides a rapid and non-destructive analytical tool. It yields highly compound-specific information for chemical analysis, and has great potential for multi-component analysis. The Raman technique also requires little sample preparation, which allows on-line analysis and field applications. One limitation of conventional Raman spectroscopy is its low sensitivity, often requiring the use of powerful and costly laser sources for excitation. However, discoveries in the late 1970s indicated that Raman scattering efficiency could be enhanced by factors of up to 10^6 when a compound is adsorbed on or near special metal surfaces. The technique associated with this phenomenon is known as surface-enhanced Raman scattering (SERS) spectroscopy. Raman and SERS spectroscopy for the detection of hazardous chemicals, such as environmental pollutants, explosives, and chemical warfare agents or simulants, has been reviewed (1,2). Raman spectroscopy is rapid, non-destructive, and highly compound-specific. This technique has multi-component analysis potential and requires little sample preparation, which allows on-line and in-field analysis.

In this seminar two recent bioanalytical applications of the SERS, namely dopamine determination and DNA mapping, will be presented.

References

- [1] T.Vo-Dinh. "Surface-Enhanced Raman Spectroscopy". In *Photonic Probes of Surfaces*, P.Halevi, Ed., Elsevier, New York (1995).
- [2] A. Ruperez and J.J Laserna," Surface Enhanced Raman Spectroscopy" in, *Modern Techniques in Raman Spectroscopy*,1996, Wiley, New York (1996)