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Contribution ID: **3798** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Optical fiber probe for the detection of chemicals: Rhodamine 6G and Crystal Violet

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Authors fabricated a unique plasmonic structure using gold nanorods (GNRs) along the length of a tapered fiber using a well-known phenomenon called "Optical tweezing". The plasmonic structure, known as an optical fiber probe, was used to detect chemicals at lower concentrations. Surface-enhanced Raman spectroscopy (SERS) technique was used to obtain the data for chemicals adsorbed on the probe. The fiber probe was manufactured using a dynamic etching process. We will present the Raman spectra of Rhodamine 6G and Crystal Violet (CV), extensively used in the food and textile industry. Manufacturers use CV in aquaculture for its anti-parasitic and anti-microbial properties, which help prevent diseases and infections in fish and seafood farming. The usage of CV contains elevated toxicity levels, and the residue is strictly forbidden in food due to potential carcinogenic and mutagenic properties that pose a potential threat to both human and aquatic life. R6G is a synthetic dye commonly used in the food industry to provide color to various food products such as candies, energy drinks, sauces, dressings etc., as well as in the textile industry that uses massive amounts of dyes which is a major cause of water pollution. The manufactured probe is reliable, sensitive and compact. The "dip and dry"technique was used to adsorb analytes (R6G and CV) with different concentrations on the gold-nanorods coated fiber probe. The results based on GNRs (aspect ratio 3.8 and longitudinal surface plasmon resonance (LSPR) wavelength 785 nm, Nanopartz, USA) show that the minimum concentrations detected for R6G and CV were 10-12 M and 10-11 M, respectively.

Keyword-1

Raman Spectroscopy

Keyword-2

Plasmonic

Keyword-3

Optical Fiber

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