

Abstract Submitted  
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**Detection of residual traces of explosives by Surface Enhanced Raman Scattering using gold coated substrates produced by nanospheres imprint technique** FERNANDO CALZZANI, REDAHEGN SILESHI, AS-CHALEW KASSU, JEAN MICHEL TAGUENANG, ABDUL CHOWDHURY, ANUP SHARMA, PAUL RUFFIN, C. BRANTLEY, E. EDWARDS — Explosives detection for national and aviation security has been an area of concern for many years. In order to improve the security in risk areas, much effort has been focused on direct detection of explosive materials in vapor and bulk form. New techniques and highly sensitive detectors have been extensively investigated and developed to detect and identify residual traces that may indicate an individual's recent contact with explosive materials. This paper reports on the use and results of Surface Enhanced Raman Scattering (SERS) technique, to analyze residual traces of explosives in highly diluted solutions by using low-resolution Raman spectroscopy (LRRS). Detection sensitivity of this technique has been measured by using samples of explosives such as TNT, RDX and HMX evaluated at different concentrations. Additionally, results from homemade SERS substrates have been compared to a commercial gold-coated substrate of nanocavities. Sample concentration, starting from 1000ppm was gradually diluted to the smallest detectable amount. Raman spectrum was obtained using a portable spectrometer operating at a wavelength of 780nm.

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