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Title:Terahertz spectroscopic uncertainty analysis for explosive mixture components determination using multi-objective micro-genetic algorithm

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Abstract:In practical applications, many suspicious samples may be a kind of mixture and consist of various chemical components that make the spectral analysis difficult. Various explosives and related compounds (ERC) in the mixture can be identified and the concentration of each component can be estimated based on the known spectral data of the pure explosive components. In this paper, the terahertz spectroscopic uncertainty analysis using a micro-GA has been proposed, in which the random assignment of alleles from parents to offspring is implied. An intelligent computation-based technical road-map is also provided for the analysis and optimisation of the terahertz spectroscopic combination analysis. A simulation with two given test cases for the ERC has been devised. The results of the simulation show that micro-GA and its derivatives have the potential applications in the fields of security, medicine and food industry to fast identify mixtures. Number of references:47