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IS35. IR COUPLED CHEMOMETRICS IN ENVIRONMENTAL, INDUSTRIAL AND FORENSIC STUDIES

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Environmental and forensic scientists along with industrial institutions are exploring more use of IR spectroscopy together with chemometrics for various applications. It can be used to detect the pollution level of the environment and to screen the promising microbial isolates to be applied for the bioremediation. Food, petroleum, drug industries and tire factories apply this technique both in their laboratories and in field for analytical purposes. IR spectroscopy has also gained attention in criminology due to its high sensitivity and speed in the analysis of evidential material. Identity and gender of a victim, narcotic drug abuse, toxins and explosives can be identified using this technique coupled to chemometrics. Analysis of body fluids is also possible for the identification of forensic species, which is a crucial part of investigation at a crime scene. Moreover, it can be administered for robust and efficient identification of old skeletal fossils or fragmented anatomical remnants, which is a difficult task for forensic specialists. It is known that biological agents such as bacteria and viruses can be exploited in bioterrorist acts or germ warfare. Rapid discrimination of these microbial species are achieved using IR based identification methods in forensic studies. In our study, we applied IR coupled chemometrics for the determination of heavy metal resistant environmental bacterial species. Although we did not study the forensic features of these bacteria directly, knowing the environmental microbial profile can help to find the place where the crime took place and to reveal the timeframe in good confidence.

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