

Advances In Analytical Techniques For Environmental Forensic – A Review [†]

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Abstract: In the past decades, environmental monitoring has witnessed a marked increase in both frequency and relevance. This domain of analysis relies on sophisticated, fully automated measurement devices capable of continuous and autonomous operation over extended durations, providing real-time or near-real-time data on the subjects under investigation. The establishment of proper environmental monitoring systems is crucial for evaluating the health of ecosystems, but it's difficult because there are so many different factors that need to be measured over various amounts of space and time. Forensic analytical techniques play an important role in environmental investigations concerning source attribution and chronological determination. These methodologies encompass chemical profiling, corrosion modeling, elucidation of chemical associations with equipment, and modeling of pollutant transport. Biosensors have gained considerable attention in recent years for their potential to monitor environmental contaminants, owing to their enhanced specificity, sensitivity, affordability, user-friendliness, environmental compatibility, portability, and capability for real-time, remote monitoring. Despite the proliferation of biosensors tailored to detect environmental toxins, there remains considerable scope for the exploration of novel, sustainable biosensor technologies. The importance of these analytical approaches has grown exponentially in the field of environmental forensics, particularly in discerning culpability for pollution incidents and guiding cleanup efforts in regions characterized by diverse waste streams.

Keywords: environmental monitoring; automated measurement devices; forensic analytical techniques; biosensors; environmental forensics.

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Conflicts of Interest

The authors declare no conflict of interest.