

Licensing opportunity

Discrimination of biological and non-biological species

Background

Standard plating techniques for microbiological analysis require long incubation time and dedicated laboratory analysis (~2 days). Moreover, they are specific and limited to bacterial strains that can be grown on substrates. Flow-based methods are emerging technologies but they need large quantity of chemical consumables and frequent human interventions.

Invention

Based on pump-probe fluorescence spectroscopy for time-resolved detection or imaging, this invention allows to identify and/or discriminate biological species (peptides, proteins, bacteria, viruses, pollens, spores, etc) to non-biological species (poly-aromatic hydrocarbons, carbons aerosol, soot, etc) in water, air or on surfaces. The key point is the use of traditional nanosecond sources (compact, cost-effective) to a femtosecond system. The method uses the finding that the UV-induced fluorescence of biological molecules is depleted by the addition of visible radiation, whereas this does not occur with non-biological organic molecules. Thus, the discrimination arises from a differential approach, i.e the comparison of the total fluorescence signals, recorded with and without additional visible radiation, of bio and non-bio particles/species.

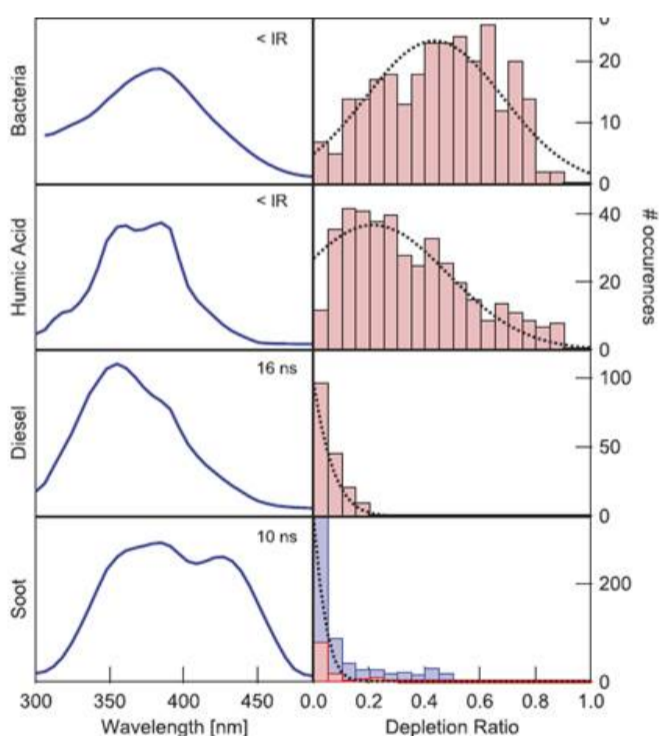


Fig. 1 Results for the discrimination between bio (Bacteria, humid acid) and non-bio species (Diesel, soot).

Advantages

- Real-time *in-situ* monitoring
- Portable
- Large volume analysis
- Cost-effective
- Consumable-free
- Reduced human intervention

Patent status

- Patent pending WO 2017/033049 A1

Potential markets

- Water infrastructures/distribution, hospitals, food industries, production lines, ...

Technology Readiness Level

1 2 3 4 5 6 7 8 9