专业英语第2次随堂作业

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**Paper title:** Smartphone compatible on-site fluorescence analyzer for spilled crude oil based on CMOS image sensor.

**Background:** Oil spills, both in the ocean and inland waters, have negative effects such as mass mortality and habitat destruction. Photodetectors, such as photodiodes and photo multiplier tubes, which are commonly used in existing instrumentation, have inherent limitations because they are capable of only single-pixel detection.

**Purpose:** The authors develop a spilled oil point-of-testing device (SOPD), a field measurement system for immediate onsite fluorescence monitoring of oil concentrations.

**Results:** The performance of the equipment reported in this paper was demonstrated by measuring the linear measurement range and the limit of detection using five different kinds of crude oil.

**Innovation points：**

①The SOPD uses LEDs as excitation light sources, captures the fluorescent light emitted from the crude oil with a CMOS image sensor, and analyzes the captured image using a smartphone, thereby improving user convenience while minimizing sample analysis time.

②The multi-million-pixel image sensor (i.e., Full HD or UHD) enables the fluorescence analysis to eliminate the noise generated in the field, as compared with existing systems that use a single-pixel optical sensor.

③The developed system has been demonstrated to be a universal measuring instrument capable of detecting not only low-concentration samples at the ppb level but also high-concentration samples in several hundred ppm.

**Future works/Discussions：**

Cross-domain applications：For examples, SOPD, which can quantitatively analyze the fluorescence content of the crude oil, has a great potential to be used in a variety of fields requiring quantification of fluorescence such as measurements of chlorophyll, colored dissolved organic matter, and green algae.

**References：**有3篇2017年以后的paper，占比1/10。从录用的2019年往前计算，近5年的references数量7篇，占比23.3%，文献较新。