EE/CprE/SE 491 WEEKLY REPORT 8

Start Date 04/15/2019 – End Date 04/19/2019

Group number: sddec19-07

Project title: Rapid detection of Fentanyl using a multifunction nanostructured

Client & Advisor: Meng Lu

Team Members/Role:

Yifu Zhang - Stationary phase fabrication group
Zheyuan Tang - Stationary phase fabrication group
Hao Wang - Testing group
Ugerah Abalu - Testing group
Kossi Egla - Instrumentation group
Olouwole Eteka - Instrumentation group

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o **Weekly Summary**

This week we ran a chromatography test using a grated titanium dioxide plate. The test material, liquid food dye, was spotted on the Titanium dioxide UTLC plate and immersed in a solvent mixture of ethyl acetate, methanol and water(65/23/10). The food dye was able to move up the plate, while placed in a vertical direction, but the seperation wasn't the best. After reexamining at the grating structure, we realised that the grating is actually vertical to the plate, so in the next experiment we would be trying to align the grating structure with the direction of placement of the plate to allow for maximum flow and better separation

o **Past week accomplishments**

Yifu Zhang

1.Analyze the sample solution and Its chemical components

2. Learnt the process for making the photonic sensor

Hao Wang

1. Tested the sample dye on the photonic sensor
2. Working on the final version of project plan

Zheyuan Tang

1. Tested the sample dye on the photonic sensor
2. Learning the principle of photonic crystal.

Ugerah Abalu

1.Learned more about the fabrication of the photonic sensor
2.Worked on the Design Document

Kossi Egla

1. Still working on the arduino/arducam for the image processing
2. Talk with our advisor(Dr. Lu) about how the photonic sensor will be made

Olouwole Eteka

1.Worked on arduino/arducam code to take a picture
2.Worked on the project plan document

o **Pending issues**

Align the grating structure with the direction of placement of the plate to allow for maximum flow and better separation

Instrumentation

We need to figure out the right wavelength at which our camera can read any infrared reflection from the chromatography sensor.

o **Individual contributions**

NAME	Individual Contributions	Hours this week	Hours cumulative
Hao Wang	1. Worked on the final version of project plan 2. Tested the sample dye on the Titanium oxide plastic plate	6	48
Zheyuan Tang	1. Made new sample dye and tested it on the photonic crystal which coating with the Titanium dioxide. 2. Try to figure out the way to separate the dye.	6	48
Ugerah Abalu	1. Worked in the lab to trial run a chromatography experiment using Titanium oxide plate fabricated on plastic as the stationary phase and spotted food dye on the plate. 2. Made the mixture of mobile phase for experiment using a ratio of ethyl acetate, methanol and water	6	48
Yifu Zhang	1. Revise the project plan for the final version 2. Work on the chromatography experiment with dye on the	6	48

	Titanium oxide plastic plate		
Kossi Egla	1. Worked on how to connect the infrared LED to the arduino. 2. Thinking about the best way to align the infrared LED and the camera.	6	48
Olouwole Eteka	1. Worked on the infrared LED wiring 2. Sketched the shape of the instrument for future 3D work	6	48

o **Plans for the upcoming week**

Group 1 Fabrication:Zheyuan Tang, Yifu Zhang:
Since this time we figure out the capillary force occurred on both grating structure and GLAD structure.So we plan to test the sample in a new type of photonic sensor which has longer period to see if we can separate the dye on it.

Group 2 Sample Test: Hao Wang,Ugerah Abalu:
Continue to work with the fabrication group to test the food dye sample on a new plate/grating structure

Group 3 Instrumentation: Kossi Egla, Olouwole Eteka:
We will be working on the 3d shape of the instrument. We will also test couple different infrared LED to confirm the sensitivity of the camera.