EE/CprE/SE 491 WEEKLY REPORT 6

Start Date 04/01/2019 – End Date 04/07/2019

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 were trying to solve the problem of the capillary force on the UTLC plate. We change the deposition material Silicon dioxide and Aluminum dioxide to the Titanium dioxide. In addition, we change the mobile phase solution which is ethyl acetate, methanol and DI water with the ratio of 65/23/10. The results showed the UTLC plate are able to soak the mobile phase solution, while they cannot separate the test sample.

o **Past week accomplishments**

Yifu Zhang

Try to figure out the which type of high polarity chemical can mix with water and researched the GLAD principle

Hao Wang

Researched the better solvents to use for chromatography process and observed and realized how the fabrication process works.

Zheyuan Tang

Figure out the problem that UTLC plate has small capillary force with mobile phase.

Ugerah Abalu

Researched better solvents to use during chromatography process and communicated with research assistant regarding production of ultra thin layer chromatography plates samples to use in experiment

Kossi Egla

We order the arduino board from ETG and got a camera from our professor. We also talk with our professor about the next step about our project.

Olouwole Eteka

We order the arduino to and the camera that is going along with it. We have to touch base with the professor to talk about the frame of our design.

o **Pending issues**

Mobile phase are able to move on the ULTC plate, but are not able to seperate the sample test. We think this phenomenon are more like they are not able to dissolve the test sample.

Instrumentation

Arduino doesn't have enough processing power to analyze a picture so we are working on a solution for this

- **Individual contributions**

NAME	Individual Contributions	Hours this week	Hours cumulative
Hao Wang	1.Looked through the specific section “Standard solution” on research paper. 2. Learned how the photonic sensor would suppose to be made. 3. Learned what the material for the photonic sensor would be.	6	30
Zheyuan Tang	1. Research the reason that mobile phase not flow on the UTLC plate. And figure out the problem may be the capillary force and hydrophilicity 2. Solve the problem of mobile phase solution unable flow on UTLC plate	8	38
Ugerah Abalu	1. Learned more about the fabrication of the photonic sensor 2. Worked on the Design Document	6	36
Yifu Zhang	1. Analyze the sample solution and Its chemical components. 2. Learn about how to	6	30

	make the photonic sensor		
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	6	30
Olouwole Eteka	1.Worked on arduino/arducam code to take a picture 2.Worked on the project plan document	6	30

o **Plans for the upcoming week**

Group 1 Fabrication:Zheyuan Tang, Yifu Zhang:
Fabricate the photonic crystal device which has the grating nanostructure. Our goal is to deposit the oxide on this device so that they have better property on hydrophilicity and convenient to be detected through infrared light.
Group 2 Sample Test: Hao Wang,Ugerah Abalu:
We have put in orders for new solvents(Beta-carotene, trans-canaxanthin, fucoxanthin) to use in separating spotted dye on the Titanium dioxide UTLC plate

Group 3 Instrumentation: Kossi Egla, Olouwole Eteka:
We need to input the picture file to the computer and analyze it. We will be using MATLAB probably so we need to start working on the MATLAB code as well.