Synthesis and Size Optimization of Functionalized Silica and Magnetic Core Nanoparticles Using Chemometrics: Impacts on the Removal of Pesticides from Contaminated Water Samples

18 March 2020
Outline

1. Goals and objectives

2. Achievements and outcomes

3. Post Projects Plans
Goals and Objectives

- To Synthesize Trimethyl-Functionalized Core-Shell Magnetic Nanoparticles (mcSNPs) with:
  - Magnetic Properties $\uparrow$
  - Uniform PS $\downarrow$
  - Homogenous PSD $\downarrow$

- Magnetic Solid Phase Extraction (MSPE) of Pesticides.

- Synthesis:
  - Modified Mössbauer Method $\rightarrow$ Core
  - Stöber Method $\rightarrow$ Coat

- Design of Experiments (DoE)
Ammonia

TEOS

PMA

Water

DSD

X1

X2

X3

Y1 = Uniform PS

Y2 = Homogenous PSD

SEM

TGA

Raman

FTIR
Achievements and Outcomes

- Two papers were submitted for publication
- Students have presented their papers in the following conferences:
  - PCFM2019 (Cappadocia, Turkey);
  - Green and Sustainable Chemistry (SQU, Muscat, Oman);
  - ACS – MENA (Qatar)
  - Many local conferences.
Post Projects Plans

- Work will be extended to use nanoparticles in treatment of different contaminated matrices.