Plan Overview

A Data Management Plan created using DMPTool

Title: Large-Scale Photocatalytic Degradation of Pharmaceuticals in Continuous Flow Real Wastewater Effluent using Natural Solar Illumination: An Experimental and Numerical Approach

Creator: George Nnanna

Affiliation: Purdue University System (purdue.edu)

Principal Investigator: George Nnanna

Data Manager: George Nnanna

Funder: National Science Foundation (nsf.gov)

Funding opportunity number: PD 15-1440

Template: NSF-ENG: Engineering

Last modified: 10-19-2016

Large-Scale Photocatalytic Degradation of Pharmaceuticals in Continuous Flow Real Wastewater Effluent using Natural Solar Illumination: An Experimental and Numerical Approach

Roles and responsibilities

The Data Management Plan should outline the rights and obligations of all parties as to their roles and responsibilities in the management and retention of research data. It must also consider changes to roles and responsibilities that will occur should a principal investigator or co-PI leave the institution.

The PI, Dr. Nnanna, is responsible for overall management of the project. He is specifically responsible for the design and fabrication of the experimental facility as well as conducting all the experimental tests. Furthermore, he will coordinate water sample collections from participating wastewater treatment plants and coordinate meetings and teleconferences.

Co-PI, Dr. Vargo, is responsible for analytical tests to measure the concentration of pharmaceutical contaminants.

Co-PI, Dr. Kim, is responsible for the numerical simulations.

Justus Ndukaife (Ph.D. student) will provide support to both Drs. Nnanna and Kim.

Mr. Bob Theodorou of Gary Sanitary District will provide assistance with sample collections.

All data generated will be stored in an R-drive within Purdue university Water Institute. Access to the data will be available to all PIs.

Expected data

The Data Management Plan should describe the types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project. It should then describe the expected types of data to be retained.

The data expected will include the degradation rate based on changes in carbon dioxide before and after the reactors, and changes in pharmaceutical concentrations; effects of pH, flow rate, exposure time, natural organic matter, influent concentration, solar intensity and photocatalyst particle size on degradation efficiency.

Period of data retention

The Data Management Plan should describe the period of data retention. Minimum data retention of research data is three years after conclusion of the award or three years after public release, whichever is later. Public release of data should be at the earliest reasonable time. A reasonable standard of timeliness is to make the data accessible immediately after publication, where submission for publication is also expected to be timely. Exceptions requiring longer retention periods may occur when data supports patents, when questions arise from inquiries or investigations with respect to research, or when a student is involved, requiring data to be retained a timely period after the degree is awarded. Research data that support patents should be retained for the entire term of the patent. Longer retention periods may also be necessary when data represents a large collection that is widely useful to the research community. For example, special circumstances arise from the collection and analysis of large, longitudinal data sets that may require retention for more than three years. Project data-retention and data-sharing policies should account for these needs.

There is no time limit for keeping the data. The data will be shared with wastewater treatment plants to enable them optimize photocatalytic reactor. It will be presented in conferences, and published in journals. The data will also be made available to relevant departments such as environmental engineering and biology that have interest in photocatalysis.

Data formats and metadata

The Data Management Plan should describe the specific data formats, media, including any metadata.

The experimental data will be available in EXCEL spreedsheet format and also graphically. The numerical codes is based Density Function Theory (DFT), Molecular Dynamics (MD), and Finite Element Method (FEM).

Data dissemination and policies for public access, sharing and publication delays

The Data Management Plan should clearly articulate how "sharing of primary data" is to be implemented. It should describe dissemination approaches that will be used to make data available to others.Policies for public access and sharing should be described, including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements. Research centers and major partnerships with

industry or other user communities must also address how data are to be shared and managed with partners, center members, and other major stakeholders. Publication delay policies (if applicable) must be clearly stated. Investigators are expected to submit significant findings for publication quickly that are consistent with the publication delay obligations of key partners, such as industrial members of a research center.

The data will be disseminated in the following forms:

a. Wastewater Treatment Plant through workshops

b. Conference presentations and journal publications

c. Engineering Summer Program for High School students

d. Teachers Camp - each summer, high school teachers are invited for one-week to take remedial lectures on emerging topics in engineering

e. Posted on the Purdue Water Institute website, http://centers.pnw.edu/water-institute/

Data storage and preservation of access

The DMP should describe physical and cyber resources and facilities that will be used for the effective preservation and storage of research data. In collaborative proposals or proposals involving sub-awards, the lead PI is responsible for assuring data storage and access.

The department of mechanical engineering at Purdue University Northwest and Purdue Water Institute both have an R-drive that is accessible to the university over an unlimited time. The strategy for storing the data in longer-term is to work with the Purdue Northwest Information Technology department to create a directory for storing the data in the R-drive.

All the PIs from Purdue will be responsible for managing the data in the R-drive.

Co-PI, Dr. Vargo of the University of Iowa also have a similar data management capibility at his institution.
