Data Management Plan

Expected data production in the course of the project: Over the course of the project it is expected that the most significant data generated will include 1) DFT model of CH₄/CO₂ adsorption on catalyst; 2) elucidation of dry methane reforming and coking mechanism; 3) factors governing dry methane reforming chemistry for production of desirable syngas compositions and yield; 4) electrochemical dry methane reforming results including CH₄ conversion rate, H₂ and CO production rate, CO₂ permeation flux, and syngas yield and composition; 5) a system process model predicting optimal technical and economic performance.

Data and data format used in archiving project results: All data produced from the project including process parameter recording, characterization data and analysis results will be archived by laboratory notebooks and computers. To ensure the maximum utility, raw data, if possible, will be archived in ASCII (or .txt) format with a file header describing the file contents.

This project will likely produce a catalytic model for dry methane reforming chemistry, a multiphysics model for ionic transport in dual-phase membranes and a system model. The data entry and results output for the models can be in Excel or equivalent format, and are transferrable to future more comprehensive models.

Policies for data sharing: Research products will be released in conference and through journal publications at the earliest reasonable timeline. As is usual for journal publications, sufficient data needs to be included in the body of the journal article in question to support the results reported, and more extensive supporting results can be included in journal supplementary materials, thus employing the publication mechanism for permanent archival of research data.

It is not expected that any of the research products for the proposed project will require particular care in providing protection of privacy, confidentiality or security. However, the data/images/models generated from the project are considered intellectual properties of the creators/investigators. Information on materials, methods and processes that are patentable will be released only after filing patent applications with IP offices at the University of South Carolina.

Plans for research products archival: Research products will be archived as 1) researchers’ lab notebooks; 2) electronic appendices to graduate student’s theses produced by the project in data-CD or data-DVD format; 3) materials in technical publications and their supplementary materials, and 4) materials that cannot be easily archived in technical publications or their supplementary materials will be placed in a lab Wiki site with universal read rights for the specific project in question. The lab Wiki site will be housed at servers of University of South Carolina accessible to the research teams. 4) The experimental samples tested and prepared will be constantly stored in enclosed containers for at least three years.

As indicated in the NSF-ENG Data Management Plan guidance, the minimum period for which research products will be archived and readily available is three years after conclusions of the project or three years after public release of the materials, whichever is later. Research data that supports a patent will be retained for the entire term of the patent.