

23<sup>rd</sup> International Conference on **Advanced Materials**  
June 20-21, 2018 Oslo, Norway

10<sup>th</sup> International Conference on  
**Chemistry Education and Research**  
June 21-22, 2018 Oslo, Norway

### **Embedding petrochemical/nuclear components into analytical curricula: The chemical STEM bridging**

**Mian Jiang**

University of Houston Downtown, USA

Petrochemical components were recently incorporated into our curricular efforts. The main driving force lies at the societal relevance of a sustainable analytical chemistry curriculum. Crude oil exploration, processing, and production of basic, intermediate, and final petrochemicals, all bear the natures of material and characterization studies. They are in line with the University's high-impact education mission and one of the local economic focuses (as the world's energy capital). Despite of the natural match or extension between analytical sciences and petro-industry, few reports in this curricular incorporation were published thus far. We started with the incorporation of petrochemical experiments into undergraduate research and STEM workshops. These directly address a wide spectrum of petroleum/petrochemical industry and study. The experiments, designed and tailored to reflect material science and characterization means, included the crude oil viscosity measurement (addressing the up-stream exploration sector), corrosion quantitation (for the mid-stream pipeline or transportation), and preliminary polymer production and characterization (for down-stream end-user products). These ideas were also tested in the existing analytical chemistry classes for teaching effectiveness. Initial responses were positive, with the rising enrollments and motivation to learn. Some students showed interests to deepen these practices into problem-based learning (PBL) after regular labs. Our current activities concentrate on the embedding of non-aqueous (petroleum liquid) titration for chemical analysis, and characterization of hydrocarbon-bearing rocks and carcinogen petrochemicals (benzene, toluene, ethylbenzene and xylene (BTEX)) in instrumental analysis. Our efforts in updating analytical curriculum are preliminary and forward-looking. They have the potential to improve learning in both material and characterization studies and may expand into other chemistry disciplines or interdisciplinary fields.

#### **Biography**

Mian Jiang has completed his PhD from Wuhan University and Research Associate Studies from Northwestern University and New Mexico State University respectively. He currently teaches Analytical Chemistry at the University of Houston Downtown. He has published more than 50 papers in peer-reviewed journals and served in various professional capacities in his institution and fields.

jianggm@uhd.edu

#### **Notes:**