Western South Carolina Chapter of American Institute of Chemical Engineers

Proposed February 2021 Virtual/ZOOM Meeting and Presentation

The exploration of cost-effective heterogeneous catalysts to produce sustainable energy and value-added chemicals is at the heart of both fundamental and industrial catalysis research. In order to allow such a large family of materials to match the elegant and promising chemistry of their corresponding homogeneous and molecular prototypes, perhaps the ultimate design goal for heterogeneous catalysts is to simultaneously maximize the dispersion of the supported catalytic metals and to display desired intrinsic chemistry per metal atom. Such a vision, in fact, sees its immediate relevance in addressing some greatest challenges faced by today's catalyst industry. For example, the high price of noble metals, due to their low abundance and supply deficit, has hindered the commercial developments of many precious metal catalysts despite their otherwise great catalytic performances. For example, even when a catalytic nanoparticle has a tiny size of 3 nm, it is well accepted by the catalysis community that at least ~70 % of the catalytic metal atoms are not contributing to any given reactions. Improving the dispersion of the supported