Fall 2016 Lecture Series
Chemical & Biomolecular Engineering

A Chemical Engineer's View of Air Quality in the Mid-Atlantic

Over the past two decades, anthropogenic pollutants have been successfully reduced in the Mid-Atlantic region of the United States, resulting in improved air quality. However, parts of the Mid-Atlantic still are considered non-attainment regions and ozone remains the main criteria pollutant of concern. Ozone is a secondary air pollutant, formed by reactions between volatile organic compounds and nitrogen oxides. Ozone precursors are mainly emitted by power plants, motor vehicles, industrial operations and biogenic sources. The role of transport versus local emissions in contributing to ozone exceedance is hotly debated. In the past several years, a new influx of emissions associated with hydraulic fracturing operations in the Marcellus shale play may be counteracting the benefits that have been gained. On the flip-side, low cost natural gas could replace coal as fuel for power plants, potentially reducing emissions. In this presentation, I will give an overview of our group's efforts to better understand Mid-Atlantic air quality, through analysis of ground level and airplane measurements of air pollution, and through simulation of emissions, chemistry and transport at a regional scale.

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