Anthropogenic Pollution in the Arctic: Assessing the Fate of Persistent Organic Pollutants in Polar Regions

Amanda M. Grannas, Department of Chemistry, Villanova University, Villanova, PA

The presence of persistent organic pollutants (POPs) in Polar Regions is of concern because their toxicological properties may have a deleterious impact on these fragile ecosystems and the native indigenous populations that make the Arctic their home. In fact, recent studies indicate that humans and their food sources may be negatively impacted by the bioaccumulation of these pollutants. Although the presence of POPs in the Arctic is widely acknowledged, little work has considered the potential for POPs to be transformed via natural processes in the Arctic environment. It has been shown that the polar snowpack plays an important role in processing atmospheric species such as mercury, nitrogen oxides, alkyl halides, ozone, carbonyl compounds and molecular halogens. Photochemical transformations of anthropogenic organic contaminants in ice also have been observed, although published information regarding these processes is scant. The transformation of organic contaminants in freshwater and marine sediments may also be of concern. Numerous studies have been conducted to investigate the behavior of anthropogenic pollutants in mid-latitude sediments, however few studies have focused on sediment chemistry in Arctic regions. This seminar will discuss our recent efforts to better understand the ultimate fate of anthropogenic pollutants in the Arctic region, focusing on snow, ice and sediment chemistry.