Contribution ID: **7** Type: **Poster**

Ice Photochemistry Mediated by Dissolved Organic Matter: Degradation of Persistent Organic Pollutants

Monday 6 June 2011 12:05 (1h 10m)

Contamination and accumulation of persistent organic pollutants (POPs) in the Arctic, an area previously considered as pristine and removed from human influence, has become a growing concern. Volatile and semi-volatile contaminants from lower latitudes are transported to the Arctic through a process known as global distillation. The polar regions are unique in that they sit in darkness during the winter until polar sunrise. These conditions allow pollutants to accumulate during winter and then undergo 24-hours of continuous irradiance in sunlit conditions. Photochemical degradation may thus be an important pathway to consider in the spring/summer Arctic season.

Aldrin and dieldrin, globally distributed pesticides, are of particular environmental concern due to bioaccumulative properties, known persistence in the environment, and ability to degrade into environmentally persistent products. To investigate the potential photochemical degradation of these compounds, aqueous solutions in liquid and frozen phases were irradiated under Q-Panel 340 lamps to simulate the UV radiation profile of natural sunlight. Following irradiation, samples were extracted with organic solvent containing an internal standard for GC-ECD analysis. Aldrin degraded quickly in the presence of natural organic matter, with frozen samples degrading more quickly than liquid samples. Dieldrin also showed photochemical reactivity, albeit on a much slower timescale. We report here the differences in liquid and frozen reactivity, the influence of different sources of natural organic matter, and the effect of temperature on degradation half lives.

Please list some keywords

snow, photochemistry, dissolved organic matter, persistent organic pollutants

Author: Dr GRANNAS, Amanda (Villanova University)

Co-authors: Ms PIERCE, Brittany (Villanova University); Ms BOBBY, Rachel (Villanova University)

Presenter: Dr GRANNAS, Amanda (Villanova University)

Session Classification: Lunch and Poster