

# The 12<sup>th</sup> Annual Harold I. Schiff Lecture

## Faculty of Pure and Applied Science

Presented by:

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### *Oxidation Power of the Atmosphere*

Friday, December 13, 2002

2:30 p.m.

Senate Chamber, N940, Ross Building

**Abstract.** The lecture will address the stability of global atmospheric hydroxyl (OH) chemistry in view of anthropogenic changes.

The atmospheric lifetime of reduced and partly oxidized natural and pollutant gases is controlled by their oxidation into soluble compounds, which are subsequently removed by deposition processes. The oxidation process is mostly initiated by OH radicals, formed from the photodissociation of ozone. Therefore, OH is the cleaning agent of the atmosphere. Global OH concentrations have been derived from long-term measurements of the tracer gas methyl chloroform. These measurements have furthermore been used to estimate global OH trends, indicating substantial interdecadal changes. If correct, this might imply that the atmospheric oxidation capacity is not stable against perturbations. It appears that the marine atmosphere has

been OH depleted by growing anthropogenic emissions of methane and carbon monoxide, whereas in regions more strongly polluted by nitrogen oxides OH has increased. Future atmospheric composition changes will likely be largest in the tropics where the oxidation power is highest and OH chemistry is most sensitive to perturbations.