

Sulphur gas affects ozone

Carbonyl sulphide is the most abundant sulphur gas found in the lowest layer of the Earth's atmosphere. This compound is formed naturally and also as a result of chemical reactions between the atmosphere and carbon disulphide – a chemical produced by various industrial processes. Increased levels of sulphate particles, or aerosols, in the atmosphere have been linked to ozone layer depletion. Sulphate aerosols also influence global climate, causing cooling effects by scattering incoming solar rays and reducing the amount of radiation reaching the Earth.

Recent estimates obtained from ice core samples collected from West Antarctica suggest that human activities account for approximately 25 per cent of the modern carbonyl sulphide in the atmosphere. The collected ice core samples have provided researchers with an archive of air from 1616 to 1694, allowing them to determine the concentration of carbonyl sulphide prior to industrial inputs. Researchers crushed 11 core samples within a vacuum to collect air trapped in the ice. The samples were then analysed to obtain a mean carbonyl sulphide mixing ratio, or concentration of carbonyl sulphide in the sample, expressed in parts per trillion by volume, over the 78-year period. This pre-industrial mixing ratio is about three-quarters that of the modern carbonyl sulphide mixing ratio.

Also, the team did not find any loss of carbonyl sulphide from the ice cores over time. This finding implies that with further measurements it should be possible to generate a record of atmospheric carbonyl sulphide concentrations further back through time, allowing researchers to develop a baseline against which to measure current carbonyl sulphide levels. *Contact: Mr. Harvey Leifert, American Geophysical Union, the United States. Tel: +1 (202) 7777 507; E-mail: hleifert @agu.org.*
(Website: www.earthobservatory.nasa.gov)