

Sulfate: (1) A compound containing the $[SO_4^{2-}]$ group, as in sodium sulfate (Na_2SO_4); (2) A salt of sulfuric acid.

Sulfate ion (SO_4^{2-}): The doubly negative ion of sulfuric acid (see H_2SO_4).

Sulfur Dioxide (SO_2): A toxic, irritating, colorless gas; soluble in water, alcohol, and ether; boils at $-10^\circ C$; used as a chemical intermediate in paper pulping, a solvent, a disinfectant, and a preservative; emitted by the combustion of sulfur-bearing fuels. Also known as sulfurous acid anhydride. In the atmosphere it is one of the major acidifying agents.

Sulfur oxides: Oxides of sulfur, such as sulfur dioxide (SO_2) and sulfur trioxide (SO_3).

Surface element: A physical feature of a surface.

Surface resistance: The resistance to the uptake of atmospheric constituents exhibited by a surface.

Surrogate: The term applied to a parameter which is used to represent another. For example, modeling hydrogen ion behavior in the atmosphere is difficult, so that sulfate ion is often used as a substitute.

Susceptibility: A receptor or receptor area is said to be susceptible if it is both sensitive and receiving a pollutant loading or stress of sufficient magnitude.

Synoptic Scale: In meteorological terms, the scale of motion of the order of 500-5000 kilometers (continental scale).

Temporal Resolution: The minimum time during which meaningful differences in results can be determined (using a particular model). For example, models using upper air data which are only available every six hours are limited in their temporal resolution to about 6 hours.