washout ratio is strongly dependent on the microphysical processes of precipitation growth, W values being 10 to 50 times higher when abundant cloud water was available (and snowflake growth was primarily through collection of supercooled droplets) than when negligible liquid water was detected in the clouds (and growth was primarily by vapour deposition on snowflakes).

2.1.3 Summary

To summarize the above discussion on wet deposition of sulfur compounds: it would seem that for sulfur dioxide, the washout coefficient for both within- and below-cloud processes can show a strong seasonal dependence (order-of-magnitude or more), even after seasonal variations in precipitation rate are taken into account, because of temperature and pH effects on the solubility and the low uptake of the gas by ice crystals.

The available data on particulate sulfur wet scavenging is too meager to allow any definite conclusions about seasonal differences. All one can say is that below-cloud scavenging coefficients for rain and snow seem to be of the same order-of-magnitude. However, rates of in-cloud processes depend strongly on the specific mechanisms involved (Scott, 1978; 1981), and seasonal variations in storm type could result in corresponding changes in scavenging rates of an order-of-magnitude or more, but more data are needed to substantiate or disprove this speculation.

2.2 Dry Deposition

The dry deposition rate of gases and particles to the earth's surface has usually been parametrized using a deposition velocity v, defined by the equation

$$v = Mc^{-1}, \tag{9}$$

where

M = the flux of material,
C = the ambient concentration at a particular height,