

and v (which is a function of height) refers to the same level as the concentration measurement.

2.2.1 General Considerations

To better understand the role of different factors which affect the deposition velocity, it is convenient to work in terms of resistances to transport. The total resistance, r_t , defined as the reciprocal of v ,

$$r_t = v^{-1}, \quad (10)$$

can be broken down into an aerodynamic resistance, r_a , and a surface resistance, r_s :

$$r_t = r_a + r_s. \quad (11)$$

The surface resistance can be further split into a resistance due to an usually thin stagnant air film adjacent to the absorbing surface, r_b , and an actual resistance to transport within the surface (for plants, this is largely the canopy stomatal resistance), r_c (Wesely and Hicks, 1977; Chamberlain, 1979):

$$r_s = r_b + r_c. \quad (12)$$

The magnitude of the aerodynamic resistance, r_a , is largely governed by atmospheric turbulence in the boundary layer, which in turn depends on factors such as wind speed, atmospheric stability, and characteristics of the surface (i.e., the surface roughness). There are well-known micrometeorological formulae relating r_a to meteorological and surface parameters (see, e.g., Garland, 1978; Wesely and Hicks, 1977). The value of r_a decreases as the wind speed and surface roughness increase, and also depends to a certain extent on the atmospheric stability, although the latter dependence only seems to become marked when the atmosphere is very stable--e.g., for Pasquill stability category F (Sheih et al., 1979). Because of the dominant influence of turbulent diffusion, r_a should be the same for both particles and gases, except where the particles are so large that gravitational settling plays an