

Report 2F-A contains supporting papers with material pertinent to the topic of this chapter, and two chapters of the recent EPA Critical Assessment Document (CAD) on Acid Deposition provide in-depth reviews of the wet and dry deposition topics. (Executive summaries of these two chapters are included in MOI Report 2F-A). Rather, the intent is to provide guidance on the adequacy of deposition simulation in those LRT models selected for use in the context of the MOI, in view of the competing demands for accurate portrayal of scientific knowledge, and immediate application in the policy development area.

5.2 Current Understanding of Deposition Processes

Deposition processes may be classified into two types: wet and dry. Wet deposition processes involve precipitation and deliver pollutants to the surface in an irregular but somewhat concentrated form. Dry deposition processes do not involve precipitation, and they provide for a slower but more continual deposition. Figure 5.1 shows schematically the several wet and dry deposition processes.

Dry deposition of gases and particles smaller than a few micrometers occurs by turbulent mixing and transport to the near-surface region. Within millimetres of the surface, a region of quasi-laminar flow may exist through which gases are transferred by molecular diffusion and particles by Brownian diffusion. Uptake at the surface is accomplished by chemical reaction, adsorption, dissolution or foliar uptake in the case of gases, and by impaction on and interception by surface elements in the case of small particles. The deposition of larger particles is assisted by sedimentation.

Wet deposition involves the incorporation of substances into precipitation elements and subsequent fall to the surface. Small particles may serve as condensation nuclei for cloud droplets which

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