the lack of vertical resolution in the models makes them less applicable to intermediate-range assessments.

Source-oriented Lagrangian models may have adequate or sufficient vertical resolution, but the puff or plume segment dimensions and dispersion rates normally pertain to point sources. Many of these models would require considerable modifications to make them useful for intermediate-range urban plume applications.

An examination of the characteristics of the 42 models, in light of the above discussion, allows a classification of the models according to whether they are (a) ideally suited to treating urban emission, (b) suitable, but perhaps with insufficient resolution for intermediate scales, and (c) not suitable without considerable modifications or numerous emissions simulations. Table 2 shows the models categorized in this manner. Note that the classification neglected the particular pollutants treated (SO_x, NO_x, HC, etc.).

(c) Simulation of Detailed Chemistry

The majority of regional and intermediate-scale air quality models focus on sulfur chemistry or simulate tracer species, or radioactive species only. However, a number of mesoscale and regional-scale photochemical models have been developed, and recent efforts to model the chemical composition of rain have resulted in the addition of simplified NO_x chemistry to those models primarily designed for sulfur treatment. A recent comparison of two photochemical oxidant models, and their sensitivity to input assumptions, may be found in Hov and Derwent (1981). This paper also contains a useful list of references.

The survey of 42 regional-scale models (SAI, 1982) has provided information from which a list has been prepared showing the level of sophistication of the chemical mechanism treated in each model. This is presented in Table 3.

A similar review of operational models that describe the transport, diffusion, and chemical transformation of air pollutants on a horizontal