

ATOC 3500 Midterm 1 Review

Chapter 1

Composition of the atmosphere (p 1-4)

Ideal gas law

Temperature, pressure and density (p 9-12)

Atmospheric density, $[M]$

Mixing ratio (p 11, p 224-226)

Dry mixing ratio

Water, humidity, and latent heat (p 4-6)

Greenhouse gases (p 8)

Energy balance (p 6-8)

Visible vs. infrared radiation (p 8)

Atmospheric motion (p 12-17)

General circulation (p 17-19)

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Chapter 2

Natural air pollution (p 23-24)

Anthropogenic air pollution (p 24-31)

Types of smog (p 24-26)

Particles and haze (p 26-27, 55-60)

Sources of pollutants (p 27-31)

Gas phase pollutants (p 31-55)

Carbon dioxide (p 31-33)

Hydroxyl and oxygen singlet delta (p 35-36, 53)

Oxidation of hydrocarbons (p 43-50)

Carbon monoxide and ozone (p 33-36, 54-55)

Nitrogen oxides (p 38-42, 51-54)

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Chapter 3

Vertical motion in the atmosphere (notes)

Hydrostatic balance and the barometric law (notes)

Adiabatic lapse rate (p 75-76)

Influence of water on the lapse rate (p 75)

Stability and inversions (p 75-80)

Conditional stability (or instability) (see useful links)

Dispersion and transport (p71-74)

Terms to know (see Glossary)

Accumulation mode aerosol

Adiabatic lapse rate

Adsorption

Aerosol

Air pollution

Aitken mode (same as nuclei mode) aerosol

Albedo

Ambient air

Anticyclones

Atmospheric density

Atmospheric lifetime

Atmospheric pressure

Atmospheric stability

Terms to know (see Glossary)

Atmospheric transport

Biogenic pollutants

Carbon dioxide

Carbon monoxide

Chlorofluorocarbons

Climate change

Cloud condensation nuclei

Coagulation

Coarse particles

Combustion

Concentration

Condensation

Convection

Coriolis effect

Terms to know (see Glossary)

Cyclones

Deliquescence

Deposition velocity

Diffusion

Dispersion

Dry deposition

Elemental carbon

Emission rate

Epidemiology

Fine particles

Geostrophic winds

Global warming

Gravity

Greenhouse effect

Terms to know (see Glossary)

Hadley cell

Haze

Humidity

Hydrocarbons

Hydroxyl radical

Inversion

Lapse rate

London-type smog

Long-range transport

Los Angeles-type smog

Macroscale

Mesoscale

Mesosphere

Methane

Terms to know (see Glossary)

Microscale

Mixing height

Mobile source

Mode

Nitrates

Nitric acid

Nitric oxide

Nitrogen dioxide

Nitrogen oxides

Nitrous oxide

Nucleation

Nuclei mode

Organic carbon

Oxidation

Terms to know (see Glossary)

Ozone

Particles

Peroxy radicals

Photochemical oxidants

Photochemical smog

Photochemistry

Planetary boundary layer

Plume

Point source

ppmv (i.e. mixing ratio)

Pressure gradient force

Primary pollutant

Radiational inversion

Radiative forcing

Terms to know (see Glossary)

Rainout

Saturation vapor pressure

Secondary pollutant

Smog

Solar constant

Solar spectrum

Soot

Stable air

Stationary source

Stoichiometric ratio

Stratosphere

Subsidence inversion

Sulfates

Sulfur dioxide

Terms to know (see Glossary)

Sulfur oxides

Sulfuric acid

Synoptic scale

Tropopause

Tropopause

Turbulence

Ultrafine particles

Ultraviolet light

Urban plume

Visibility

VOCs (volatile organic compounds)

Washout

Wind