AP ENVIRONMENTAL SCIENCE • EXERCISE SHEET

9.1 Stratospheric Ozone Depletion

Name: _____ Class: _____ Date: _____ **Total: 10 marks**

KEY WORDS ozone 臭氧 • cfcs 氯氟烃 • the ozone hole 臭氧洞

Objective

Build the skills to answer exam questions on **stratospheric ozone depletion**.

You must be able to:

- explain how **CFCs** 氯氟烃 destroy stratospheric **ozone** 臭氧
- distinguish "good" (stratospheric) from "bad" (ground-level) ozone
- describe the effects of ozone loss

1 Worked examples

Study these first. Each one shows the method for a question type used later — follow the steps and you can do the Practice and Exam-style questions yourself.

Good vs bad ozone

- **Stratospheric ("good") ozone** shields Earth from UV.
- **Ground-level ("bad") ozone** is a pollutant in smog that harms lungs.

This subtopic is about **depletion of the good, stratospheric** ozone.

How CFCs destroy ozone

CFCs (once used in aerosols, refrigerants) drift up to the stratosphere, where UV breaks them apart to release **chlorine**. Each chlorine atom destroys **many** ozone molecules in a chain reaction.

The ozone hole

Depletion is worst over **Antarctica** (the "ozone hole"), where cold conditions speed the reactions.

Effects

Less ozone lets more harmful **UV** reach the surface, increasing **skin cancer**, cataracts, and harming crops and plankton.

2 Practice

Now apply the methods above.

2.1 Which chemicals are the main cause of ozone depletion? [1]

2.2 What atom released from CFCs destroys ozone? [1]

2.3 State one effect of increased UV from ozone loss. [1]

3 Exam-style questions

3.1 Stratospheric ozone is important because it [1]

A B
C D

A causes smog
B absorbs harmful UV radiation
C warms the ground
D is a greenhouse gas only

3.2 CFCs from old refrigerators reach the stratosphere.

(a) Explain how they destroy ozone. [3]

(b) State one health effect of the resulting UV increase. [1]

3.3 Distinguish “good” stratospheric ozone from “bad” ground-level ozone. [2]