

7.6 Reduction of Air Pollutants

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS scrubbers 洗涤器 • catalytic converters 催化转化器 • electrostatic precipitators 静电除尘器

Objective

Build the skills to answer exam questions on **reducing air pollutants**.

You must be able to:

- describe control technologies (**catalytic converters** 催化转化器, **scrubbers** 洗涤器, filters)
- explain regulation (**Clean Air Act**, emission standards)
- link each method to the pollutant it targets

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.

■ Control technologies

- **Catalytic converters** (cars) — convert CO, NO_x, and unburned fuel into less harmful gases.
- **Scrubbers** (smokestacks) — spray a liquid to remove SO₂.
- **Electrostatic precipitators / filters** — remove **particulates** from exhaust.

■ Regulation

Laws like the **Clean Air Act** set **emission standards** limiting how much pollution sources may release, forcing cleaner technology.

■ Prevention vs cleanup

Reducing the source (efficiency, renewables, less driving) prevents pollution; control devices clean it up after it forms. Prevention is often better.

■ A worked match

A coal plant uses **scrubbers** for SO₂ and **precipitators** for particulates; a car uses a **catalytic converter** for CO/NO_x.

2 Practice

Now apply the methods above.

2.1 What does a catalytic converter reduce? [1]

2.2 What does a scrubber remove from smokestack gases? [1]

2.3 What is the purpose of emission standards? [1]

3 Exam-style questions

3.1 A device that removes SO₂ from a smokestack is a [1]

- **A** catalytic converter
 - **B** scrubber
 - **C** wind turbine
 - **D** solar panel
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3.2 A coal power plant must reduce its emissions.

(a) Name one technology to remove particulates and one to remove SO₂. [2]

(b) Explain how emission standards force cleaner operation. [2]

3.3 Explain why preventing pollution at the source is often better than cleaning it up afterward. [2]

Solutions

2.1 CO, NO_x, and unburned hydrocarbons from car exhaust.

2.2 SO₂ (sulfur dioxide).

2.3 To limit how much pollution sources may release.

3.1 B — a scrubber.

3.2 (a) Particulates: electrostatic precipitator/filter; SO₂: scrubber. (b) They set legal limits, so plants must install control technology or reduce output to comply.

3.3 Prevention avoids creating the pollutant at all (saving cleanup costs and avoiding leaks), while control devices only capture some of it after it forms.