

Exercise walk-through

Persistent Organic Pollutants (POPs) ■ 8.7

eXercise

You must be able to

- describe **POPs** 持久性有机污染物 (persistent, bioaccumulate, travel far)
- give examples (DDT, PCBs)
- explain why they are dangerous

Method — What POPs are

Persistent organic pollutants (POPs) are synthetic chemicals that:

- **persist** (do not break down for a long time),
- **bioaccumulate** (build up in fatty tissue),
- **travel long distances** (even to the Arctic), and
- are **toxic** (cause cancer, reproductive harm).

Method — Examples

DDT (pesticide), **PCBs** (industrial), dioxins. Many are now banned or restricted (e.g. by the Stockholm Convention).

Method — Why they are dangerous

Because they persist and bioaccumulate, they **build up in food chains** (biomagnification) and reach harmful levels in top predators and humans, far from where they were used.

Method — A worked link

DDT sprayed decades ago still persists and accumulates in birds of prey, thinning their eggshells — an effect that led to its ban.

Practice 2.1 ■ 2 marks

State two properties of POPs.

Solution 2.1

Worked steps

Any two: persistent, bioaccumulate, travel long distances, toxic **B1** **B1**.

Practice 2.2 ■ 1 mark

Give one example of a POP.

Solution 2.2

Worked steps

Any one: DDT, PCBs, dioxins **B1**.

Practice 2.3 ■ 1 mark

Why can POPs reach remote places like the Arctic?

Solution 2.3

Method: What POPs are

Worked steps

They persist and are carried long distances by air and water **B1**.

Exam-style 3.1 ■ 1 mark

POPs are especially dangerous because they

- A** break down instantly
- B** persist and bioaccumulate in food chains
- C** stay only where used
- D** are harmless

Solution 3.1

Method: Why they are dangerous

- A break down instantly
- B persist and bioaccumulate in food chains 
- C stay only where used
- D are harmless

Worked steps

B — persist and bioaccumulate in food chains.

Exam-style 3.2 ■ 2 marks

DDT was widely used decades ago and is still found in wildlife.

- (a) Explain why it is still present.
- (b) State one harmful effect on wildlife.

Solution 3.2

Method: A worked link

Worked steps

(a) DDT is persistent — it does not break down quickly, so it remains in the environment and in animals' tissues for decades **M1** **A1**. (b) Eggshell thinning in birds of prey (or reproductive harm) **B1**.

Exam-style 3.3 ■ 2 marks

Explain why POPs reach their highest concentrations in top predators.

Solution 3.3

Method: Why they are dangerous

Worked steps

POPs bioaccumulate and biomagnify — they concentrate up each trophic level — so top predators, which eat many contaminated prey, accumulate the highest levels

M1 A1.