

Developing Environmentally Friendly Chemical Processes

Part 1: Dialogue

Context: A Chemical Engineer who is developing environmentally friendly chemical processes to minimize pollution with a colleague.

Characters:

- **Sophia:** Chemical Engineer
 - **Ethan:** Research Scientist
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Sophia: Ethan, I've been reviewing our latest production methods, and I think we need to focus more on **green chemistry** principles.

Ethan: I agree. By implementing **sustainable synthesis**, we can reduce our reliance on hazardous chemicals and improve efficiency.

Sophia: Exactly. I also want to explore **biodegradable materials** for packaging. If we replace synthetic plastics, we can significantly reduce waste.

Ethan: That's a great idea! Have you considered how **waste minimization** techniques can be applied during production?

Sophia: Yes, one approach is to optimize reactions to reduce byproducts. This would also lower our **carbon footprint**.

Ethan: Speaking of that, we should evaluate the energy consumption of our processes. Switching to renewable energy sources could make a big difference.

Sophia: That's true. Additionally, we can improve efficiency by using catalysts that require less energy for reactions.

Ethan: Good point. We could also introduce a closed-loop system to recycle solvents and minimize environmental impact.

Sophia: I like that idea! If we present a clear plan, we might secure funding for sustainable innovation projects.

Ethan: Let's compile our findings and draft a proposal. This could be a big step forward for the company's sustainability goals.

Part 2: Comprehension Questions

1. What is the main goal of Sophia and Ethan's project?
 - (A) Increasing reaction speed
 - (B) Implementing **green chemistry** practices
 - (C) Reducing product prices
 - (D) Expanding production capacity
2. How does Sophia propose reducing **waste minimization**?
 - (A) By recycling synthetic plastics
 - (B) By optimizing reactions to reduce byproducts
 - (C) By switching to coal-based energy
 - (D) By reducing production time
3. What is one benefit of **biodegradable materials** mentioned in the conversation?
 - (A) They reduce waste
 - (B) They increase energy consumption
 - (C) They speed up production
 - (D) They lower costs significantly
4. How do they plan to reduce the company's **carbon footprint**?
 - (A) By optimizing energy use and reducing waste

- (B) By increasing production waste
 - (C) By eliminating all chemical reactions
 - (D) By using more synthetic materials
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Part 3: Vocabulary Definitions

1. **Green chemistry** – グリーンケミストリー (環境に優しい化学)
 2. **Waste minimization** – 廃棄物削減 (はいきぶつさくげん)
 3. **Biodegradable materials** – 生分解性材料 (せいぶんかいせいざいりょう)
 4. **Sustainable synthesis** – 持続可能な合成 (じぞくかのうなごうせい)
 5. **Carbon footprint reduction** – 炭素排出削減 (たんそはいしゅつさくげん)
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Part 4: Answer Key

1. **What is the main goal of Sophia and Ethan's project?**
 (B) Implementing green chemistry practices
2. **How does Sophia propose reducing waste minimization?**
 (D) By optimizing reactions to reduce byproducts
3. **What is one benefit of biodegradable materials mentioned in the conversation?**
 (A) They reduce waste
4. **How do they plan to reduce the company's carbon footprint?**
 (C) By optimizing energy use and reducing waste