

Ensuring Chemical Compatibility and Corrosion Resistance

Part 1: Dialogue

Context: A Chemical Engineer who is conducting material testing to determine chemical compatibility and corrosion resistance with a colleague.

Characters:

- **Emma:** Chemical Engineer
 - **Daniel:** Lab Technician
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Emma: We've received new samples for **chemical resistance** testing. Could you help me set up the experiment?

Daniel: Of course! Which method should we use? Are we testing for **electrochemical reaction** or general **material degradation**?

Emma: We'll start with **electrochemical reaction** analysis to assess how different materials corrode under varying conditions. Then, we'll examine **polymer stability** for prolonged exposure.

Daniel: That makes sense. Should we also apply a **corrosion inhibitor** to compare the effectiveness of protective coatings?

Emma: Absolutely. I also want to test how different temperatures affect the samples. Thermal stress can accelerate **chemical resistance** breakdown.

Daniel: Got it. I'll set up the controlled environment and make sure all the data is logged accurately.

Emma: Thanks! Once the tests are complete, let's analyze the results and determine the best materials for long-term durability.

Daniel: Sounds like a plan. I'll check the equipment and confirm that the safety protocols for handling reactive substances are in place.

Emma: Good thinking. We should document everything carefully to ensure accurate comparisons.

Daniel: Agreed. I'll finalize the setup and notify you when we're ready to start the tests.

Emma: Perfect. Let's aim to finalize our report by the end of the week.

Part 2: Comprehension Questions

1. What is the primary focus of Emma and Daniel's experiment?
 - (A) Assessing material **chemical resistance**
 - (B) Improving reaction speed
 - (C) Developing new synthetic polymers
 - (D) Reducing production costs
2. Why does Emma want to test materials at different temperatures?
 - (A) To increase energy efficiency
 - (B) To accelerate **polymer stability**
 - (C) To observe the effect of **thermal stress** on **chemical resistance**
 - (D) To reduce production time
3. What role does the **corrosion inhibitor** play in their tests?
 - (A) It strengthens the materials
 - (B) It helps determine the effectiveness of protective coatings
 - (C) It increases the speed of corrosion
 - (D) It acts as a cleaning agent
4. What is Daniel responsible for before starting the tests?
 - (A) Choosing the best materials

- (B) Writing a safety report
 - (C) Reviewing test results
 - (D) Setting up the controlled environment and ensuring safety protocols
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Part 3: Vocabulary Definitions

1. **Material degradation** – 材料劣化 (ざいりょうれっか)
 2. **Corrosion inhibitor** – 防食剤 (ぼうしょくざい)
 3. **Chemical resistance** – 耐薬品性 (たいやくひんせい)
 4. **Electrochemical reaction** – 電気化学反応 (でんきかがくはんのう)
 5. **Polymer stability** – 高分子安定性 (こうぶんしあんていせい)
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Part 4: Answer Key

1. **What is the primary focus of Emma and Daniel's experiment?**
 (A) Assessing material chemical resistance
2. **Why does Emma want to test materials at different temperatures?**
 (C) To observe the effect of thermal stress on chemical resistance
3. **What role does the corrosion inhibitor play in their tests?**
 (B) It helps determine the effectiveness of protective coatings
4. **What is Daniel responsible for before starting the tests?**
 (D) Setting up the controlled environment and ensuring safety protocols