

Infrared and NMR Representations

g12_u02_w06

Purpose and boundary

Interpret original fictional pattern cards as representations of limited evidence. No instrument use, sample preparation, procedure, or real-substance identification is requested.

Targets: I can read a supplied pattern card, connect a stated feature to a cautious structural claim, and label ambiguity. **Vocabulary:** infrared pattern, absorption region, NMR signal, integration, chemical environment, candidate. **Prerequisites:** functional groups, molecular formula, evidence constraints.

For this packet only, Card IR uses labels A (O–H-type region), B (C=O-type region), and C (no assigned region). Card N uses supplied signal labels, not an operational spectrum.

1. What is a representation card designed to summarize?

2. Why is a labeled region not a complete molecular identity?

3. On Card IR, what cautious feature claim is supported by label A?

4. What cautious feature claim is supported by label B?

5. What does label C require a reader to say about the stated assignment?

6. Why might two structures share the same broad feature label?

7. Define chemical environment as a model term.

8. What does a supplied NMR integration value compare within the stated card?

9. Why should integration not be treated as a count of every atom in every context?

10. A fictional Card N has two signal labels. What does that support about the supplied representation?

11. Card IR has label B; Card N has one signal labeled near an oxygen-bearing environment. State one combined, cautious inference.
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12. Name one claim the combined labels cannot support.
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13. A candidate drawing has no oxygen, but a card explicitly labels an oxygen-bearing environment. What comparison issue should be flagged?
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14. Why should a reader compare all supplied evidence rather than choose one favorite label?
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15. What missing information could make a label assignment less certain?
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16. Write a sentence that distinguishes a card pattern from a measured real-world result.
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17. Give one accessibility feature that makes a pattern card usable without color.
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18. A card's labels conflict with a candidate formula. What is an evidence-bounded next step?
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19. Compare the role of a formula constraint with the role of a pattern label.
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20. Write a two-sentence conclusion for a fictional card with labels A and B.
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