Water, Buffers, and Noncovalent-Force Models

g12_u03_w09

Purpose and boundary

Interpret original fictional molecular-environment cards. No biological experiment, medical claim, health advice, or real-system prediction is requested.

Targets: I can compare stated noncovalent-force models, explain a buffer as a model of pH change, and name model limits. **Vocabulary:** hydrogen bond, ion-dipole attraction, hydrophobic effect, buffer, conjugate pair, environment. **Prerequisites:** polarity, intermolecular forces, acids/bases, equilibrium models.

All cards are fictional. They represent possible patterns, not complete biological explanations.

1. What is a noncovalent interaction in a model?

2. Distinguish an intermolecular attraction from a covalent bond.

3. Why is water polarity useful in a stated molecular-environment model?

4. What does ion-dipole attraction describe?

5. What does a hydrogen-bond model describe?

6. Why is hydrophobic effect a model of system behavior rather than a single new bond?

7. Define buffer in an introductory equilibrium model.

8. What paired components are usually represented in a buffer model?

9. Why does a buffer not guarantee no pH change?

10. What information is needed before a buffer model can make a quantitative claim?

11. Fictional Card A shows a polar group near water labels. State one supported model relation.

12. Fictional Card B shows a nonpolar region clustered away from water labels. State one cautious model relation.

13. Why may multiple noncovalent interactions act together?

14. Why should a structure drawing not be treated as a fixed, complete biological state?

15. Name one factor a simple water-interaction card may omit.

16. What is one claim a buffer card cannot establish about a person or organism?

17. Write a sentence that separates a molecular model from a health claim.

18. Give one text annotation that improves access to an interaction diagram.

19. Compare a force model with a measured observation.

20. Write a two-sentence bounded interpretation of a fictional buffer-and-water card.