Radical Reaction Preserves Stereochemistry, Researchers Find

Description

A new chemical reaction has been developed which allows chemists to make certain molecules more easily. This reaction keeps the special structure of the molecules, known as stereochemistry. Before this, creating these molecules took many steps. The research team, led by Phil S. Baran from Scripps Research in California, used a nickel catalyst to create two temporary radicals. One radical comes from a special compound, and the other comes from a simple alkyl halide.

Baran explains that five years ago, many chemists would have thought this reaction was impossible. He describes it as surprising that two different radicals can react without losing their structure and without any side products. This new method builds on a previous technique for another type of reaction published last year.

Daniel Weix, an expert in organic chemistry from the University of Wisconsin–Madison, is impressed by this work. He notes that preserving stereochemistry in this way is usually only seen in specific settings.

However, Baran mentions that the reaction has limits. It works best with cyclic compounds. He hopes that in the future, this new reaction will become common and easier to use.

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Comprehension Questions

Multiple Choice

1. Who led the research team that developed the new chemical reaction?
   - Option: Daniel Weix
   - Option: Phil S. Baran
   - Option: John Smith
   - Option: Alice Johnson

2. What type of catalyst did the research team use?
   - Option: Copper
   - Option: Iron
   - Option: Nickel
   - Option: Zinc

3. How many years ago did many chemists think the reaction was impossible?

Option: One
Option: Two
Option: Three
Option: Five

4. What does the new reaction preserve?

Option: Temperature
Option: Stereochemistry
Option: Solubility
Option: Viscosity

5. Which university is Daniel Weix associated with?

Option: Harvard University
Option: Stanford University
Option: University of Wisconsin–Madison
Option: MIT

6. What type of compounds does the reaction work best with?

Option: Linear compounds
Option: Cyclic compounds
Option: Branched compounds
Option: Acyclic compounds

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True-False

7. The new reaction developed involves a silver catalyst.

8. Phil S. Baran believes the reaction can be easily used in the future.

9. The reaction allows for the production of molecules with side products.

10. Stereochemistry preservation is commonly seen in specific settings.

11. The research was conducted at Yale University.

12. Daniel Weix is an expert in organic chemistry.

Gap-Fill

13. The research team used a nickel catalyst to create two temporary _____ .

14. Baran describes the reaction as surprising because two different radicals can react without losing their _____ .

15. Preserving stereochemistry is usually only seen in specific _____ .

16. The reaction has limits and works best with cyclic _____ .

17. Baran hopes that this new reaction will become common and easier to _____ .

18. Before this reaction, creating these molecules took many _____ .

Answer

Multiple Choice: 1. Phil S. Baran 2. Nickel 3. Five 4. Stereochemistry 5. University of Wisconsin–Madison 6. Cyclic compounds
True-False: 7. False 8. True 9. False 10. True 11. False 12. True
Gap-Fill: 13. radicals 14. structure 15. settings 16. compounds 17. use 18. steps

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