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# Hot Springs' Secret Process: Key to Early Life on Earth?

## Description

Scientists are still wondering where life on Earth began.

One idea is that it started near deep-sea hydrothermal vents. These are tall structures on the ocean floor that release a mix of materials.

In these vents, there are minerals called iron sulfides. Some scientists think these minerals helped create the first life forms.

Today, we can find iron sulfides in hot springs, like the Grand Prismatic Spring in Yellowstone National Park.

Our new research shows that ancient hot springs might have been important for the start of life on Earth. This study helps explain where life could have begun.

Living things change carbon dioxide from air and water into organic molecules. Many organisms, such as plants and bacteria, do this in different ways.

We found that iron sulfides could help produce methanol, which is a simple organic molecule. Our findings suggest that both deep-sea vents and land hot springs played a role in this process. This shows how iron and sulfur minerals are important in the story of life.

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## Vocabulary List:

1. **Hydrothermal** /ˌhaɪdrəʊ'θɜːrml/ (adjective): Related to the action of heated water especially in a geological context.
2. **Minerals** /'mɪnərəlz/ (noun): Naturally occurring substances that are solid and stable at room temperature representing inorganic compounds.
3. **Organic** /ɔːr'gæɪnɪk/ (adjective): Relating to or derived from living matter typically containing carbon.
4. **Sulfur** /'sʌlfər/ (noun): A chemical element with symbol S often found in minerals and important in biological processes.
5. **Sulfides** /'sʌlfəɪdz/ (noun): Compounds containing sulfur anion often associated with metal elements.
6. **Methanol** /'meθənoʊl/ (noun): A light volatile colorless alcohol used as a solvent and antifreeze and as a fuel.

## Comprehension Questions



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## Multiple Choice

1. Where do some scientists think life on Earth began?
  - Option: Deep-sea hydrothermal vents
  - Option: Mountains
  - Option: Deserts
  - Option: Forests
  
2. What are the tall structures on the ocean floor mentioned in the text?
  - Option: Deep-sea hydrothermal vents
  - Option: Mountains
  - Option: Volcanoes
  - Option: Coral reefs
  
3. Which minerals are mentioned to be found in deep-sea hydrothermal vents?
  - Option: Iron sulfides
  - Option: Gold
  - Option: Diamonds
  - Option: Silver
  
4. Where can iron sulfides be found today?
  - Option: Hot springs
  - Option: Glaciers
  - Option: Deserts
  - Option: Rainforests
  
5. According to the text, what is suggested as important for the start of life on Earth?
  - Option: Ancient hot springs
  - Option: Mountain peaks
  - Option: River valleys
  - Option: Caves
  
6. What do iron sulfides help produce, as mentioned in the text?
  - Option: Methanol
  - Option: Oxygen
  - Option: Hydrogen
  - Option: Carbon dioxide



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### True-False

7. Living things change carbon dioxide into organic molecules.
8. Iron sulfides are not considered important in the story of life according to the text.
9. The study mentioned in the text confirms that deep-sea vents played no role in the start of life on Earth.
10. The text suggests that both deep-sea vents and land hot springs may have played a role in the start of life on Earth.
11. Plants and bacteria are mentioned as organisms that change carbon dioxide into organic molecules.
12. Methanol is a complex organic molecule according to the text.

### Gap-Fill

14. Our findings suggest that both deep-sea vents and land hot springs played a role in producing \_\_\_\_\_.
15. Living things change carbon dioxide from air and water into \_\_\_\_\_.
16. Many organisms, such as plants and bacteria, are mentioned to perform the conversion of carbon dioxide into \_\_\_\_\_ in different ways.
17. Iron and sulfur minerals are highlighted as important in the story of \_\_\_\_\_ according to the text.
18. Our new research shows that ancient hot springs might have been important for the start of life on Earth. This study helps explain \_\_\_\_\_ life could have begun.

### Answer

**Multiple Choice:** 1. Deep-sea hydrothermal vents 3. Iron sulfides 4. Hot springs 5. Ancient hot springs 6. Methanol

**True-False:** 7. True



8. False 9. False 10. True 11. True 12. False

Gap-Fill: 14. methanol 15. organic molecules 17. life 18. where

## Vocabulary quizzes

### Multiple Choice ( Select the Correct answer for each question. )

1. Who are individuals responsible for producing content or ideas?

Option: Experts

Option: Creators

Option: Support

Option: Findings

2. What is essential for improvement and progress based on reactions and comments?

Option: Gather

Option: Feedback

Option: Atmosphere

Option: Security

3. What process involves systematic investigation to establish facts or reach new conclusions?

Option: Argued

Option: Algorithm

Option: Research

Option: Simulations

4. Which type of compounds contain carbon and are typically found in living organisms?

Option: Obstacles

Option: Minerals

Option: Sulfides

Option: Organic

5. What term describes the linkage or relationship between two or more elements?

Option: Findings

Option: Connection

Option: Understanding

Option: Ban

6. What process involves the circulation of hot water through rock formations?

Option: Sulfur

Option: Hydrothermal

Option: Methanol



Option: Security

7. Which term implies that something is proposed or recommended as a course of action?

Option: Support

Option: Sulfur

Option: Suggests

Option: Available

8. What refers to measures taken to ensure safety and protection?

Option: Inaugurated

Option: Security

Option: Support

Option: Gather

9. What is a step-by-step procedure used to solve mathematical problems or complete tasks?

Option: Navigate

Option: Information

Option: Sulfur

Option: Algorithm

10. What pertains to the overall mood or feeling in a particular environment?

Option: Movements

Option: Obstacles

Option: Atmosphere

Option: Creators

**Gap-Fill ( Fill in the blanks with the correct word from the vocabulary list. )**

11. \_\_\_\_\_ are individuals with specialized knowledge or skills in a particular field.

12. \_\_\_\_\_ is assistance or encouragement provided to help someone or something.

13. A \_\_\_\_\_ is an official restriction prohibiting certain actions or behaviors.

14. The new facility was \_\_\_\_\_ last week with a ceremonial opening.

15. The artist's painting captured the fluid \_\_\_\_\_ of the dancers.

16. The research project concluded with unexpected \_\_\_\_\_ that challenged existing theories.



17. Effective communication is key to building mutual \_\_\_\_\_ between individuals.
18. The panel \_\_\_\_\_ over the best approach to address the issue at hand.
19. The company's website provides detailed \_\_\_\_\_ about their products and services.
20. Pilots undergo extensive training using flight \_\_\_\_\_ to prepare for various scenarios.

**Matching Sentences ( Match each definition to the correct word from the vocabulary list. )**

21. The scientist used a spectrometer to analyze the composition of the light.
22. In the lab the researchers synthesized _____ to use as a solvent in the reaction.
23. The volcanic eruption released large amounts of dioxide into the atmosphere.
24. The geologist identified several valuable _____ in the rock samples collected.
25. The metallurgist studied the properties of different metal to optimize production.
26. The film credits acknowledged the _____ of the movie for their vision and artistry.
27. Before the meeting the team will _____ all relevant data to prepare for discussions.
28. The mentor provided valuable advice and emotional _____ to the new employee.
29. The forensic investigation required the expertise of _____ to analyze the evidence.
30. Customer _____ is crucial for businesses to improve their products and services.

**Answer**

**Multiple Choice:** 1. Creators 2. Feedback 3. Research 4. Organic 5. Connection 6. Hydrothermal 7. Suggests 8. Security 9. Algorithm 10. Atmosphere

**Gap-Fill:** 11. Experts 12. Support 13. Ban 14. Inaugurated 15. Movements 16. Findings 17. Understanding 18. Argued 19. Information 20. Simulations

**Matching sentence:** 1. Spectral 2. Methanol 3. Sulfur 4. Minerals 5. Sulfides 6. Creators 7. Gather 8. Support 9. Experts 10. Feedback

**CATEGORY**

1. Sci/Tech - LEVEL1



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