



Study of rare radioactive element reveals secrets of promethium properties by ORNL

Description

Oak Ridge National Laboratory (ORNL) recently made a groundbreaking discovery about the rare radioactive element, promethium. A team at the lab published a landmark study that could potentially rewrite chemistry textbooks. It marks the first time scientists have uncovered key characteristics of promethium, a vital element that is used in nuclear batteries for pacemakers and space exploration.

Promethium is known for its scarcity, with only about one pound existing on Earth at any given time. ORNL is the sole producer of promethium-147 in the U.S., utilizing the High Flux Isotope Reactor to create unique materials. The lab's capabilities extend to producing plutonium-238 for NASA space missions and californium-252 for starting up nuclear reactors.

The discovery of promethium filled a gap in the periodic table, adding to the group of lanthanides used in modern technologies such as smartphones and car batteries. The recent research on promethium could lead to new applications and help scientists expand their understanding of this element.

The study, led by ORNL scientists, revealed hidden features of promethium that could enhance the efficiency of separating lanthanides. This new information has the potential to improve processes in various industries using lanthanides.

ORNL has a rich legacy of discovering elements, including moscovium in 2003 and tennessine in 2010. The lab's commitment to scientific innovation continues to drive research in exploring new elements and advancing technology.

Overall, the significance of ORNL's research on promethium lies in its potential to reshape the scientific landscape and open up new possibilities for using this rare element in diverse applications.

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Vocabulary List:

1. **Groundbreaking** // (adjective): Innovative and making new discoveries or advancements.
2. **Landmark** // (noun): An important/significant/historical event or discovery.
3. **Scarcity** // (noun): State of being in short supply or insufficient.
4. **Producer** // (noun): An entity or individual that creates or manufactures goods or services.
5. **Legacy** // (noun): Something handed down from an ancestor or predecessor a lasting effect or influence.
6. **Innovation** // (noun): The introduction of new ideas/methods/technologies.

Vocabulary quizzes

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

1. Who is responsible for maintaining the landscaping in a park?
Option: A) Groundskeeper
Option: B) Surfer
Option: C) Chef
Option: D) Pilot
2. What term describes the introduction of new ideas or methods?
Option: A) Tradition
Option: B) Innovation
Option: C) Stagnation
Option: D) Imitation
3. Which facilities are used for observing astronomical phenomena?



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- Option: A) Factories
Option: B) Observatories
Option: C) Schools
Option: D) Theaters
4. Who is responsible for overseeing the creation of a film or TV show?
Option: A) Producer
Option: B) Actor
Option: C) Costumer
Option: D) Director
5. Which term describes something existing at the beginning of time?
Option: A) Modern
Option: B) Primordial
Option: C) Recent
Option: D) Ancient
6. What are unverified pieces of information spread among people?
Option: A) Facts
Option: B) Truths
Option: C) Rumors
Option: D) Evidence
7. What term describes a significant or historical structure or place?
Option: A) House
Option: B) Landmark
Option: C) Hut
Option: D) Tunnel
8. Which term is used to describe a different form or version of something?
Option: A) Standard
Option: B) Variant
Option: C) Original
Option: D) Classic
9. What term describes something innovative and pioneering?
Option: A) Basic
Option: B) Normal
Option: C) Groundbreaking
Option: D) Average
10. What term refers to something left behind by a predecessor?
Option: A) Heritage



- Option: B) Novelty
- Option: C) Invention
- Option: D) Rarity

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

11. A dense fog _____ the road causing low visibility for drivers.
12. The new car model is a _____ of electric and gasoline technologies.
13. The fans _____ the release of the artist's new album.
14. The answers to the mystery were _____ leaving the investigators puzzled.
15. The new company emerged as a strong _____ in the market.
16. The cabin was _____ in the woods away from the hustle and bustle of the city.
17. The invention of the smartphone helped _____ the way we communicate.
18. The scientist studied the vast _____ trying to unlock its mysteries.
19. The sudden increase in demand led to a _____ of certain products.
20. The founder's _____ lived on through the company's philanthropic work.

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

21. The curious plot of the movie kept audiences engaged till the end.
22. The market was filled with rumors and theories about the upcoming product launch.
23. The storm clouds began to scatter and the rain subsided.
24. The artist revealed their latest masterpiece to the public for the first time.
25. The new CEO aimed to continue the successful strategies of the previous leader.
26. The hybrid plant displayed characteristics of both parent species.
27. The rare bird was an elusive sight for birdwatchers searching in the forest.



28. The groundbreaking discovery in medicine offered new hope to patients worldwide.

29. The rumors about the new product launch spread quickly on social media.

30. The rival company emerged as a strong competitor in the tech industry.

Answer

Multiple Choice: 1. A) Groundskeeper 2. B) Innovation 3. B) Observatories 4. A) Producer 5. B) Primordial
6. C) Rumors 7. B) Landmark 8. B) Variant 9. C) Groundbreaking 10. A) Heritage

Gap-Fill: 11. surfaces 12. hybrid 13. anticipated 14. elusive 15. competitor 16. secluded 17. revolutionize
18. cosmos 19. scarcity 20. legacy

Matching sentence: 1. intrigue 2. speculations 3. dissipate 4. unveiled 5. predecessor 6. hybrid 7. elusive
8. groundbreaking 9. rumors 10. competitor

CATEGORY

1. Sci/Tech - LEVEL5

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