



New Evidence of Phosphine in Clouds of Venus

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Why in News?

Scientists detected phosphine at deeper level in Venus' atmosphere than before **using the James Clark Maxwell Telescope (JCMT) at Mauna Kea Observatory, Hawaii.**

- Scientists in **2020** detected the presence of **phosphine gas** in the clouds of **Venus**.
- That discovery led to much debate and excitement about the presence of life on **Venus** given that **phosphine** is a molecule associated with biological activity on **Earth**.

Does life exist on Venus?

- **Phosphine** on **Earth** is known to be synthesized by **bacteria** thriving in environments with extremely **low levels of oxygen**.
- **Phosphine** has been detected in the deeper layers of **Venus' clouds**.
- **Scientists** have acknowledged that while the **detection of phosphine** could potentially serve as a **biosignature**, it could also be attributed to other mechanisms that are currently not completely comprehended.
- A prevalent perspective suggests that **phosphine** could potentially be produced by introducing phosphorus-containing rocks into the **upper atmosphere**, subjecting them to erosion through processes involving **water, acid**, and other factors, resulting in the formation of **phosphine gas**.

What is Phosphine (PH₃)?

- It is a **phosphorus atom** with **three hydrogen atoms** attached and is highly **toxic** to people.
- On **rocky planets** such as Venus and **Earth**, **phosphine** can only be made by life whether **human** or **microbe**.
- **Phosphine** is made naturally by some species of **anaerobic bacteria**, organisms that live in the oxygen-starved environments of **landfills, marshlands**, and **even animal guts**.
- To produce **phosphine**, **Earth bacteria** take up **phosphate** from **minerals or biological material** and add **hydrogen**.
- **Phosphine also arises non-biologically in certain industrial settings**.
- Used as a **chemical weapon** during **World War I**.
- **Phosphine** is still manufactured as an **agricultural fumigant**, is used in the **semiconductor industry**, and is a by-product of **meth labs**.

What are the Key Facts About Venus?

- **Venus** is **Earth's closest planetary** neighbor. It is also known as **earth's twin**.
- Similar in structure but slightly smaller than **Earth**, it is the **second planet** from the **Sun**.
- **Venus** is wrapped in a **thick and toxic atmosphere** that traps in heat.
- Surface temperatures reach a scorching **880 degrees Fahrenheit**, hot enough to melt **lead**. It is the hottest planet in the **solar system**.
- Highly dense, **65 miles** of **cloud** and **haze**, puts **atmospheric pressure** more than **90 times**

what's felt on **Earth's surface**.

- Also, the planet's atmosphere is primarily suffocating **carbon dioxide** and **sulfuric acid clouds**.

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