2014

Jupiter's Great Red Spot is Composed of Ammonia and Phosphine

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Recommended Citation

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**Facts About The Great Red Spot**
- 12,400 miles (20,000 kilometers) long and 7,500 miles (12,000 km) wide
- Wind at edges: 425 miles per hour
- First documented in 1831
- Composed mainly of three chemicals
  - Ammonia (NH₃)
  - Phosphine (PH₃)
  - Para-Hydrogen (para-H₂)

**Chemical Reaction**
- Chemical reaction occurs in the Great Red Spot
- Why they are red
- Problem with this reaction sequence
- Reaction rate is too high
- Most abundant at 600 mbar
- Missing reaction
- Replace reaction
- Difference in pressure and temperature dependence

**Ammonia**
- Local maximum
- Regulated by a complex interaction
- Helps cloud formation
- Useful for scientists
- Most abundant in the regions at around 400-500 mbar
- Occurs in zones above 600 mbar

**Phosphine**
- Phosphine: PH₃ → H + PH₂
- PH₃ + PH₂ → PH + PH₃
- PH + PH → P₂ + H₂
- H + H → H₂
- P₂ + P₂ + M → P₄ + M
- P₄ = P₄(s)

**Para-Hydrogen**
- Orthohydrogen
- Parahydrogen

**Conclusion**
- In Jupiter's Great Spot, ammonia, phosphine, and para-Hydrogen were found. The Great Red Spot is the local maximum of ammonia, the most abundant component of the atmosphere. The abundance of ammonia in the Spot is regulated by a complex interaction between photochemistry, condensation, precipitation, and atmospheric dynamics. Ammonia is found most abundant in the regions at around 400-500 mbar when phosphine is the most abundant at 600 mbar. The photodissociation reaction of phosphine that occurs in the Great Red Spot helps explain why the planet Jupiter and the Great Red Spot is red. The reaction sequence suggested by scientists Prinn and Lewis had some faults. Many different reactions explained how the reaction sequence could be changed to accommodate the data and observations.

**References**