



# Making Ammonia for Fuel



PURE ENERGY, WATER AND FERTILIZER FOR OUR PLANET

**ALTMERGE LLC**

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Ammonia as Fuel Conference  
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# Ammonia as Fuel Conference

Another way to make ammonia.  
Simply and locally. Chembustion...  
The use of modified combustion for  
chemical production.

# The Chemical Pathway



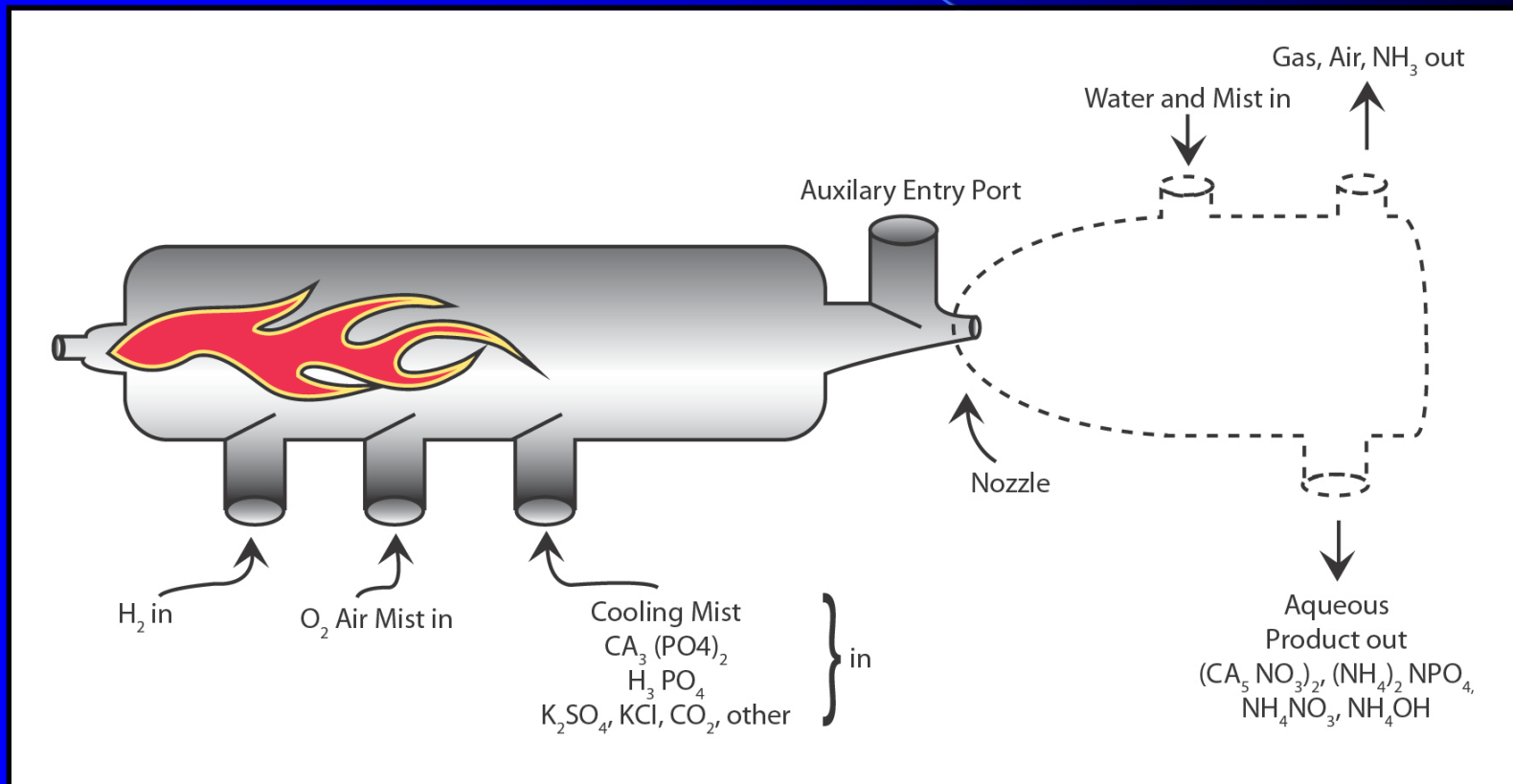
- Haber/Bosch Process



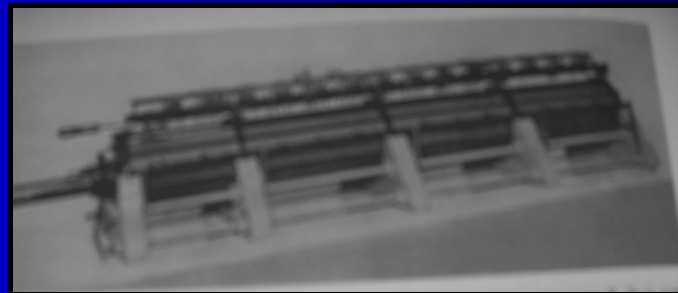
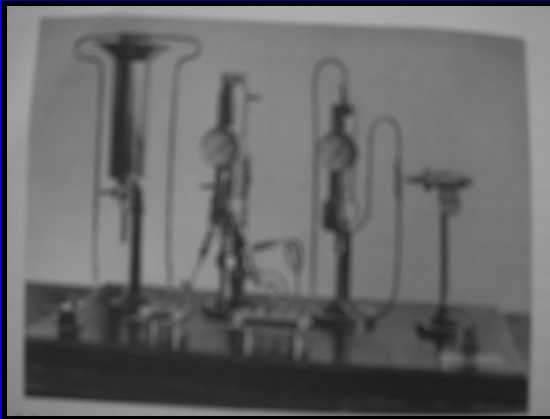
- Birkeland/Eyde/Hausser Process



# The Hydrogen Pulse Jet



# Old Sparky Actual Photos









10/9/2012





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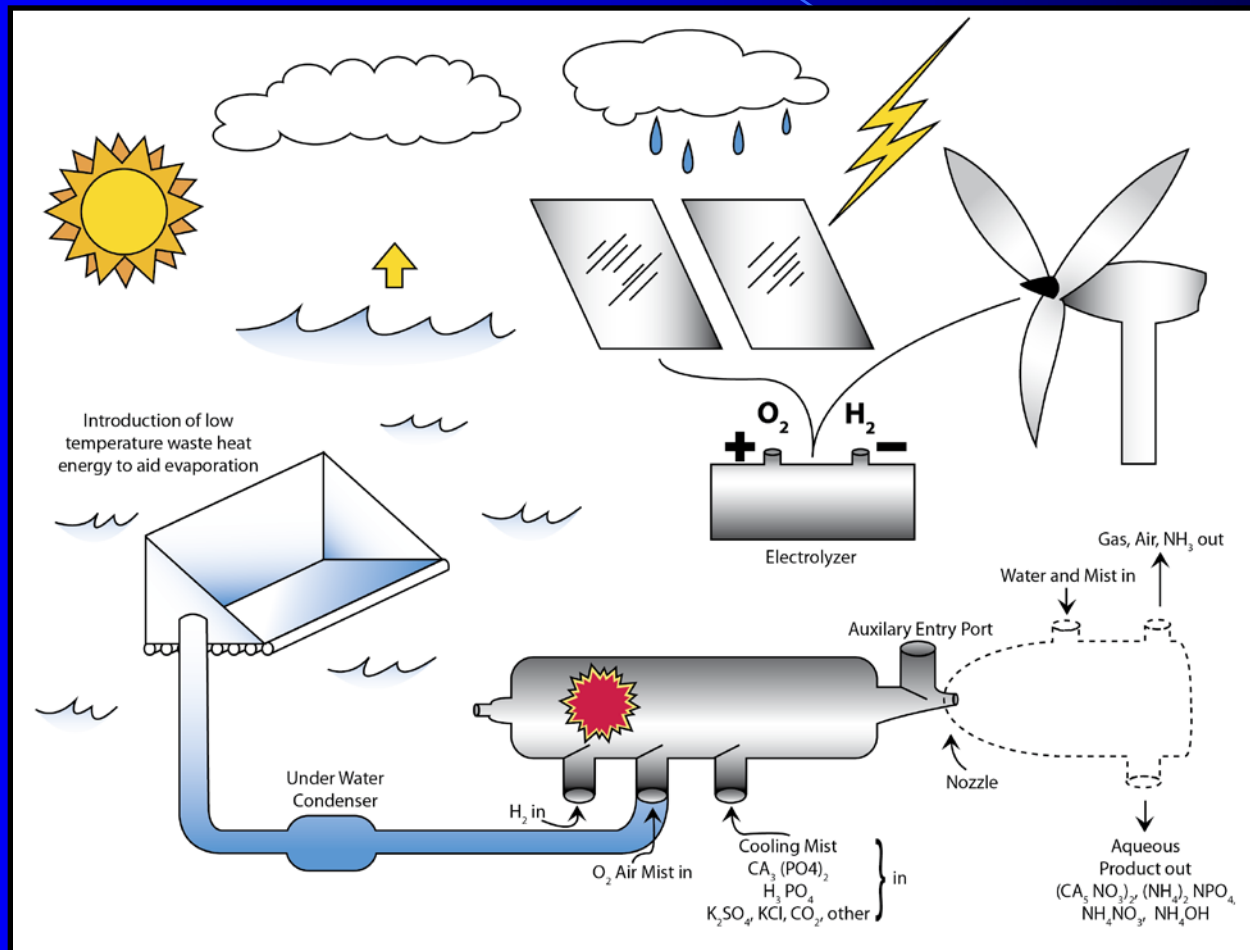
# Table of Products

	<u>Nitrate</u>	<u>pH</u>
Hydrogen Flow Furnace (H <sub>2</sub> , ambient air with vapor)	14.99 µgm/mL	6.4
Pulse Jet Initial Run	311.8 µgm/mL	6.1
Best Pulse Producing NH <sub>4</sub> NO <sub>3</sub> +NO <sub>2</sub>	1056.8 µgm/mL 0.11 gm/L H <sub>2</sub>	7.46
Modified Process, no uncombusted O <sub>2</sub> NH <sub>3</sub> →NH <sub>4</sub> OH produced in H <sub>2</sub> O	0.260 gm/L H <sub>2</sub>	9.5-11
Haber/Bosch Process Gold Standard	0.333 gm/L H <sub>2</sub>	



By introducing CO<sub>2</sub> as well, urea produced. If N<sub>2</sub> withheld and O<sub>2</sub>+H<sub>2</sub>+CO<sub>2</sub> combusted, hydrocarbons are made (CH<sub>4</sub>)

# Cartoon of System



# Potential Applications (Direct)

- 1) Ammonia, and therefore fuel and fertilizer, produced without need for hydrocarbons.
- 2) Locally scalable, inexpensive.
- 3) Production of other commercial chemicals requiring high temperatures and pressures.



Fritz Haber and Carl Bosch took a table size unit making ammonia in drops to commercialization in 2 years... funded by BASF.

Thank you for your interest.