

Ammonia Combustion Technical Working Group Meeting Minutes

July 8, 2025

- Metal Nitride Mediated Ammonia Synthesis, Meenesh Singh, UIC
- Q&A
 - Clint Bedick, NETL
 - Was this all run in autoclave?
 - Used pressure and autoclave; now they have moved away from autoclave for synthesis
 - There is a pressure dependence?
 - There is a region where pressure does not matter; but if you are nitride dependent then pressure matters
 - Clint Bedick, NETL
 - You alluded to using water. What's current state of that work?
 - Can run with some relative humidity but unstable over time. Will start to see calcium oxides and other things you don't want. Could have some downstream removal process. But huge advantages to using water instead of hydrogen.
 - David Hagen
 - Any long term effects on catalyst?
 - Design of catalyst is very important for anode side. Degradation can be severe depending on your conditions.
 - David Hagen
 - Commercial applicability?
 - They have done TEA. Could work well as a modular, small-scale operation. Will quickly be limited by energy supply needed. Want a kg-scale plant next and following TEA will be more meaningful. TRL 3-4 at this point.
- Generation and Utilization of NH₃/H₂ Fuel Blends, Colin Wolden, Colorado School of Mines
- Q&A
 - Mike Burke
 - Any N₂O emissions?
 - No N₂O coming out of reformer so just a function of how its being burner, but they do not have capability to measure at this point
 - Clint Bedick
 - What is meant by ammonia sweep gas/
 - Sweep is running a gas over the external side which reduces partial pressure of H₂ so helps with yield
 - Unknown
 - Any estimate of cost?
 - <\$0.4 per kg H₂ with no heat recuperation
 - Sai Katikaneni

- How about stability of membrane?
 - Have run up to 2000 hours with nothing but improvement in production
- Turbo Expo Summary, Clint Bedick, NETL
 - Colin Wolden
 - Interest in ammonia for marine applications remains high
- Open Discussion