



## Catalytic ammonia decomposition for on demand hydrogen production

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Presentation Preference: Oral or Poster

Career Level: Early Career Scientist (<5 yrs post PhD)

Aligned with Science Focus: methanol or hydrogen economy, renewable energy storage

### Abstract:

Technologies that use hydrogen as a fuel are increasingly becoming commercially viable. The main barrier to the uptake of these technologies has been the efficient storage and transport of hydrogen at energy densities that can compete with fossil fuels such as petrol or diesel. A way to circumvent the problem of high pressure storage of hydrogen is to use a liquid chemical storage medium, as such ammonia is a promising method. Ammonia synthesis is well established and optimised industrially, however catalytically decomposing the ammonia and purifying the subsequent gas stream are still an engineering challenge. It has been shown that for ammonia decomposition, the optimal catalyst is never the same as the optimal synthesis catalyst. For using a decomposition catalyst industrially, many other factors need to be considered other than cost and maximum efficiency, such a poisoning regimes, lifetimes, and practical operational temperatures. The current state of ammonia decomposition catalysis is reviewed.

### Biographical Statement of speaker:

Krystina Lamb completed her PhD at the University of the Sunshine Coast (USC) working on an Australian Research Council Discovery Grant funded project which focused on investigating the structure, function and proton exchange dynamics of a new type of direct methanol proton exchange membrane for low temperature fuel cells. Her areas of interest focus on techniques for physical, chemical and dynamic characterisation of materials, and include the use of synchrotron and neutron based analysis. She is now working in the Energy Business Unit at CSIRO on materials for hydrogen production from ammonia, and gas purification for applications in proton exchange membrane fuel cells.

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