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Direct route from ethanol to pure hydrogen through autothermal reforming in a membrane reactor: experimental demonstration, reactor modelling and design

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### Highlights

- Ethanol membrane reactor demonstrated for more than 50 hours operation
- 100% ethanol conversion achieved using Pt/Ni-based catalyst
- Overall HRF of 67% achieved in auto-thermal operation
- Validation of a membrane fluidized bed reactor model successfully achieved

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