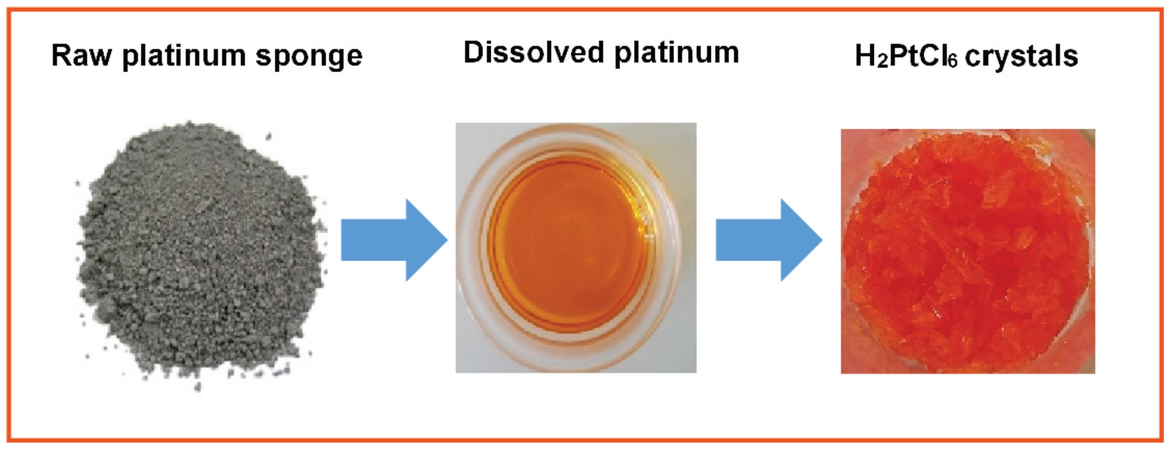
# LOHC CATALYST DEVELOPMENT

## Overview

*HySA* ***Infrastructure*** is developing heterogeneous catalysts for dehydrogenation of liquid organic hydrogen carriers (LOHCs) for $H_2$ production. First by processing raw platinum sponge into a precursor ($H_2PtCl_6$), followed by impregnating different supports. Commercial $H_2PtCl$ precursor costs 8 times more than raw platinum, therefore, this value adding processing is within SA PGM beneficiation mandate. The catalysts prepared are characterized using ICP-OES, Chemisorption analyser, BET, SEM-EDX and HR-TEM. Furthermore, catalyst performance evaluation is carried out using batch and fixed-bed reactors for dehydrogenation

## Platinum processing




## Catalyst preparation


## Catalyst Characterization

### MICROMERITICS AUTOCHEM

***Key features***

- Selective Ion Mode, Peak area, Total Ion Content (TIC)
- NIST library

***Function***

- Degree of hydrogenation
- Quantify/qualify isomer fractions and by-products

### ZETA/NANO PARTICLE ANALYZER

***Key features***

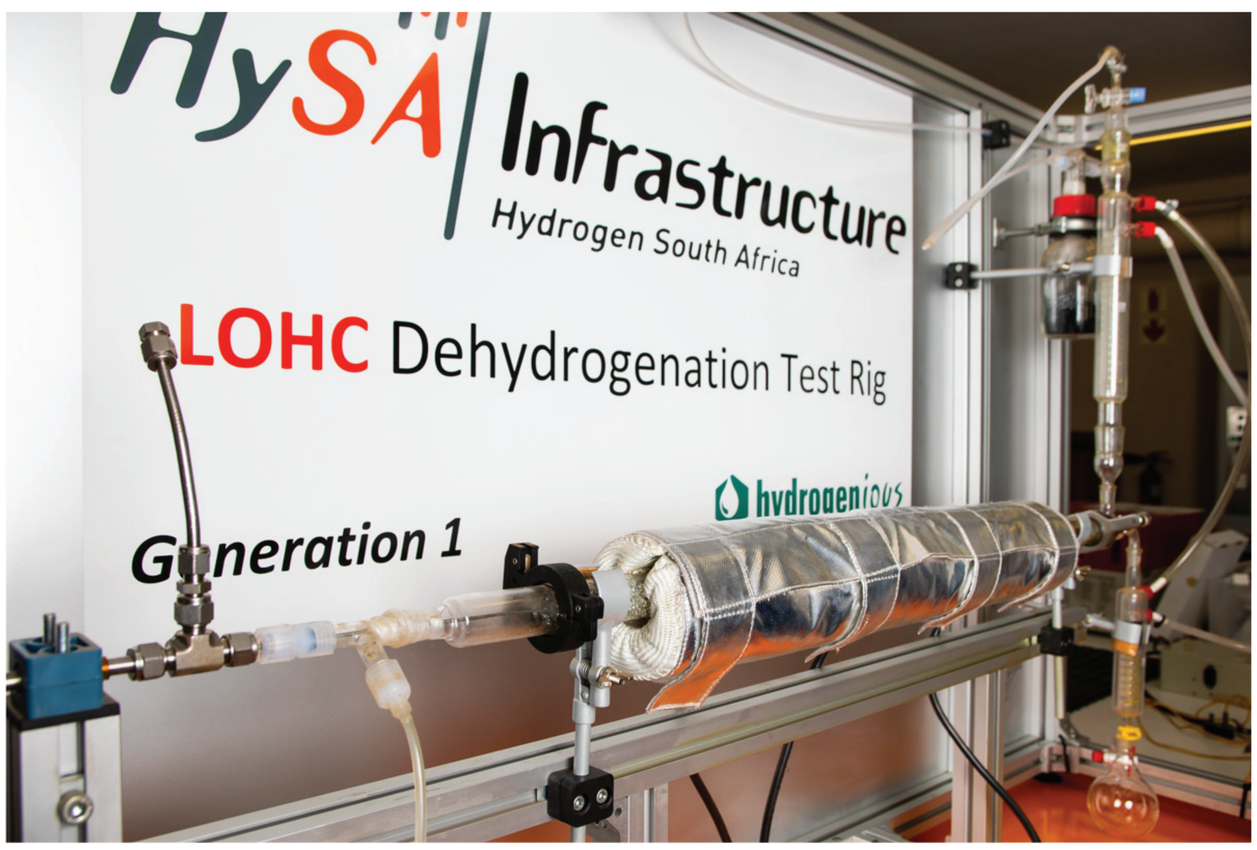
- Selective Ion Mode, Peak area, Total Ion Content (TIC)
- NIST library

***Function***

- Degree of hydrogenation
- Quantify/qualify isomer fractions and by-products

## Catalyst Evaluation

- The dehydrogenation process is controlled by an electrical switch box in combination with a PLC system
- OEM and in-house catalysts are screened using batch and fixed bed reactor setups.
- Operational parameters considered for catalyst evaluation include but not limited to temperature, catalyst loading and feed flow rate.




Horizontal fixed bed reactor


Batch reactor