TEST RIG SPECIFICATIONS

Number of reactors	3
Temperature range	20 °C–900 °C
Maximum pressure	p_{max} < 10 barg
GHSV	1,250–50,000 h^{-1}
Fluids	NH_3, H_2 and N_2
NH_3 analytic	0–100 % NH_3 0–3,000 ppm NH_3
Samples	Pellets, monoliths, meshes and powders
Max. sample size	Ø 25.4 mm, L = 50.8 mm

CATALYST TESTING AND QUALIFICATION FOR NH_3 CRACKING APPLICATIONS

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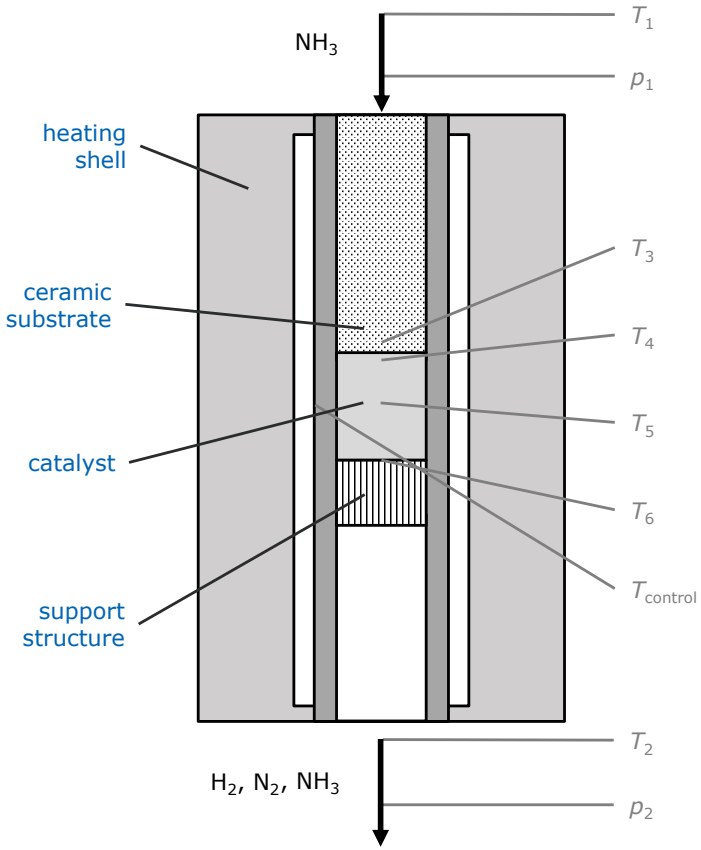
CATALYST TESTING AND QUALIFICATION

In our laboratories, we conduct independent investigations of catalyst systems for ammonia cracking applications using electrically heated integral reactors. The measurements include both screening and long-term stability tests as well as kinetic studies under controlled conditions, with operating tempera-tures up to 900 °C and pressures up to 10 bar.

The laboratory environment enables catalyst tests with an ammonia feed of up to 100 %, allowing catalysts to be tested under real conditions.

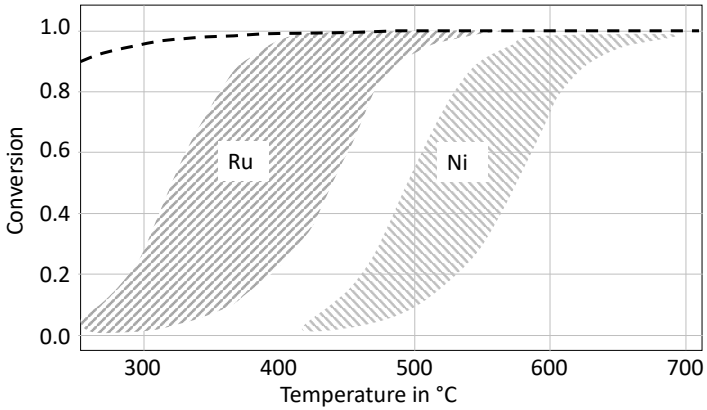


Schematic design of the electrically heated integral reactor

RESULTS

The resulting temperature- and pressure-dependent conversion is determined by measuring the gas composition in the product line using high-precision gas analysers. This enables a qualitative comparison of different catalyst systems under varying temperatures, space velocities and pressures.

Exemplary conversion ranges for Ru- and Ni-based catalysts are shown in the following figure.



Exemplary conversion curves for Ru- and Ni-based catalysts