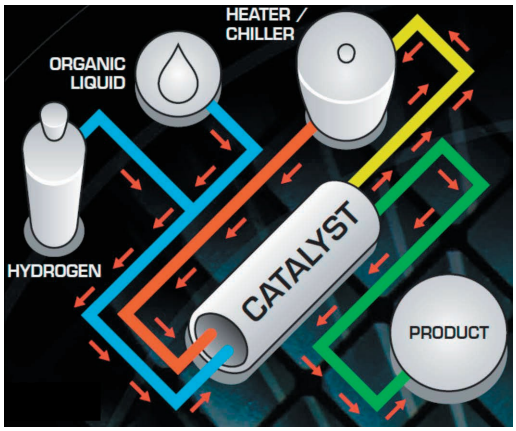
ALTAMIRA INSTRUMENTS

The First Name in Custom Reactor Systems

Catalytic Test Units (CTUs) for Process Intensification and Continuous Chemistry

Monolith and particulate catalysts for 3-phase catalytic chemical processes can be tested and developed using tubular reactor based Catalytic Test Units designed by Applied Catalysts and Altamira Instruments.



These Catalytic Test Units (CTUs) can be used for many specialty chemical processes, fine chemical and pharmaceutical chemistries, such as: hydrogenation, amination and dehydrochlorination. When used with Applied Catalysts activated carbon monolith catalysts (ACMC®), in addition to process intensification (high productivity), the advantages include: higher selectivity, better thermal management, and low pressure drop/low attrition.

Three reactors systems have been designed for catalyst screening. The single catalyst testing unit, the multiple catalyst testing unit, and the catalyst lifetime/recycle reactor testing unit. The CTU systems feature gas phase uptake measurements and differential temperature measurements, which can be used as a first level screen of catalytic activity for hydrogenation and other chemistries where gas phase products are consumed.

ACMC® Catalysts for Process Intensification

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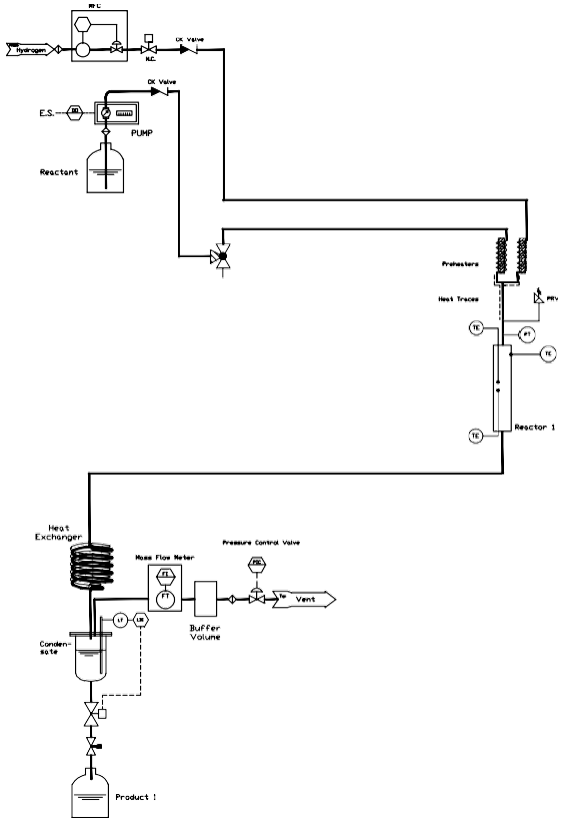
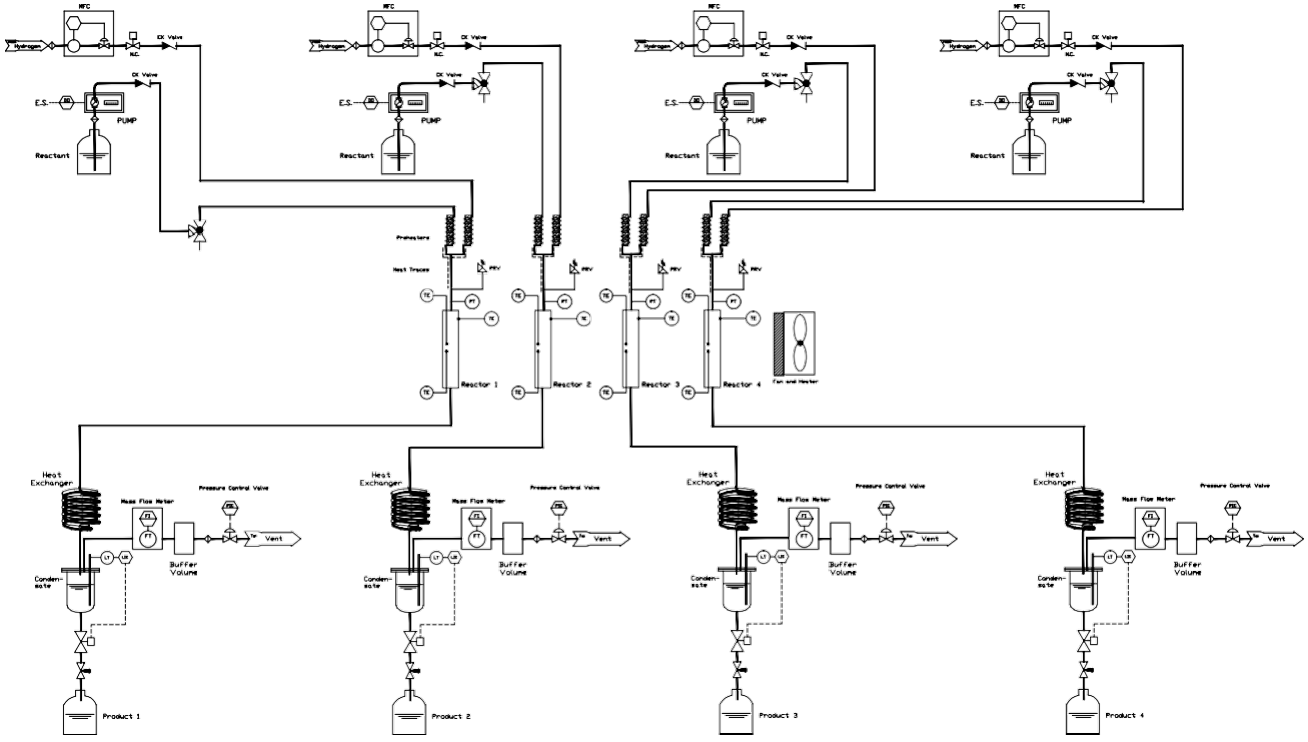
Catalyst Screening Reactor

A single catalyst can be tested in a 1.3 cm i.d. tube with 8 cm bed length, with liquid flow rates of 4 mL/min, temperatures of ambient to 250 ºC, and pressures of ambient to 100 bar.



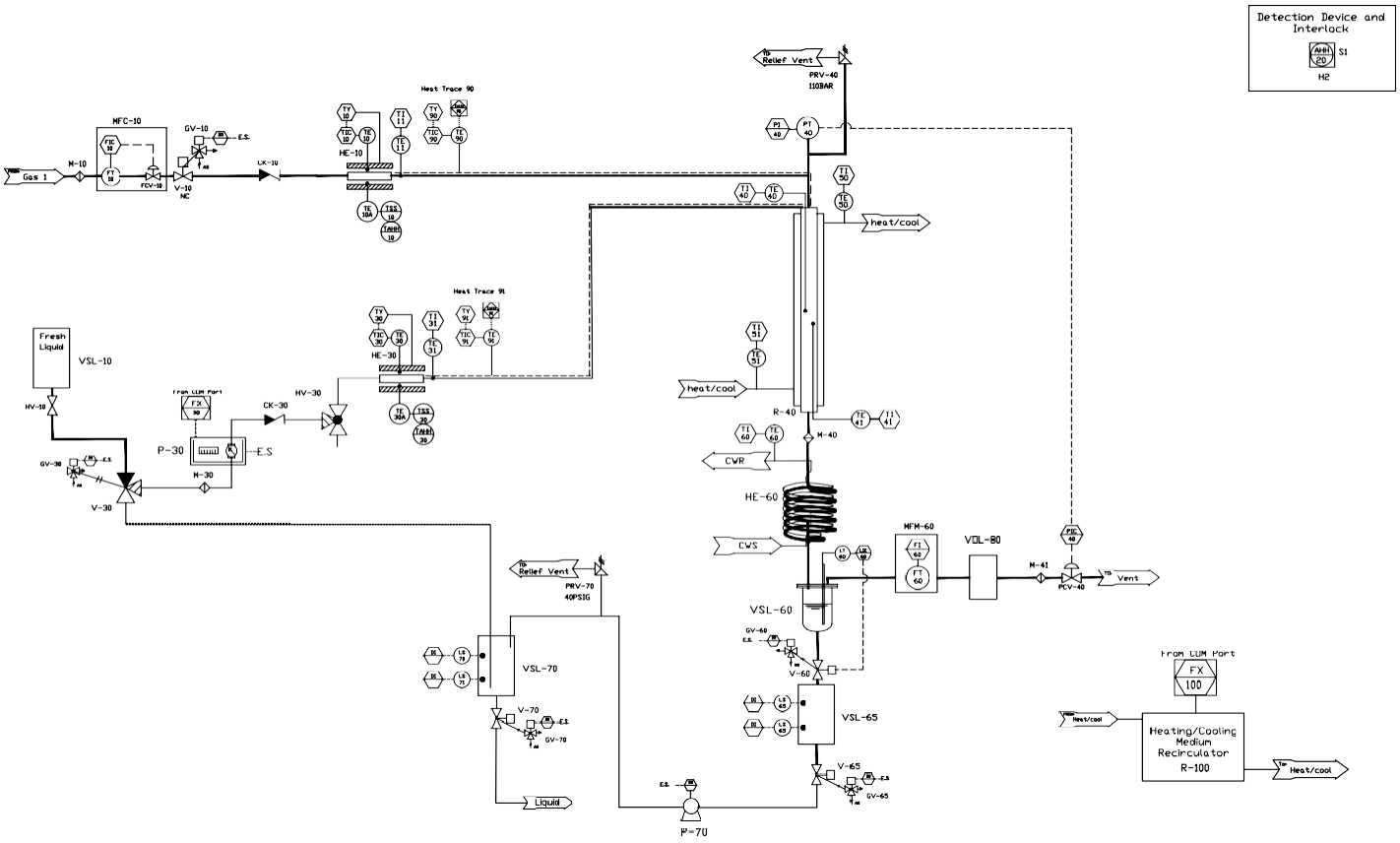
Catalyst Screening Multi-Reactor

A four reactor version of the Catalyst Screening reactor that allows for higher through-put screening.



Catalyst Development/Lifetime Reactor

A single catalyst can be tested in a 2.7 cm diameter tube with 30 cm bed length, with liquid recycle to simulate longer bed lengths at typical LHSV, P, T and with the capability to run 24/7 for lifetime studies. Liquid flow rates of 51 mL/min, temperatures of ambient to 250 °C, and pressures of ambient to 100 bar.



Features

Flow, temperature, and pressure readings are all displayed and recorded on custom software with easy interface to a third-party trending/data program.

Safety features include:

- Pressure relief valves
- Normally closed valves after feed mass flow controllers
- PLC set temperature limits

Advanced features for high pressure, liquid level sensing, and recycle can be designed on a custom basis.

Catalysts

Catalysts for these reactors are available from Applied Catalysts, including: activated carbon monolith catalysts (ACMC®), granular activated carbon catalysts (GAC), and custom catalysts, including: alumina washcoated monoliths, alumina particles and other supports. Catalytic metals include Ni, Pd, Pt, and Rh as standard catalytic products.

References

Robert J. Gulotty, Jr., Stephanie Rish, Andrew Boyd, Lee Mitchell, Scott Plageman, Corinne McGill, Joseph Keller, Jeter Starnes, John Stadalsky and George Garrison, “Run Parameters for a Continuous Hydrogenation Process Using ACMC-Pd To Replace Commercial Batch Reactor Processes”, OPR&D DOI 10.1021/acs.oprd.8b00286

https://pubs.acs.org/articlesonrequest/AOR-iiBKZP2GUAnckAR52CRZ

Our Expertise

Altamira Instruments was founded by catalyst researchers and has been in business for over a quarter of a century. Our instruments and custom reactors are marketed and supported throughout the world. Altamira’s team of scientists and engineers has extensive experience and specialize in the field of catalysis. We work closely with our customers to deliver quality instrumentation.

The Altamira *Advantage:*

- Altamira will customize these instruments to meet your exact research needs today.
- Altamira will customize these instruments in the future to meet your changing research needs.

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