News And Updates From The HEL Group

DECEMBER 2013 EDITION

Volume 4, Issue 4

FACT FILE

HP ChemSCAN

Setting Standards For Rapid Screening Of High Pressure Reactions

- 8 reactor platform
- Up To 200bar
- Independent temp. control
- Temp. from –60°C to +250°C and higher
- 16 or 75ml
- Magnetic stirring
- Individual pressure control
- Online display and calculation of gas consumption

The Ultimate In Fixed Bed, Continuous Flow Reactor

- For continuous flow screening
- Miniature unit for virtually any chemistry
- Easy switch applications
- Handles gas, liquid and two phase flow reactions with no need for adjustment
- 3ml, 10ml and 40ml+ maximum working volume
- 300°C +
- 100bar +

HEL

better chemistry – faster

BUSINESS IN BRIEF: Flow Reactors Closing Pharma And Petrochemical Research Gap For HEL

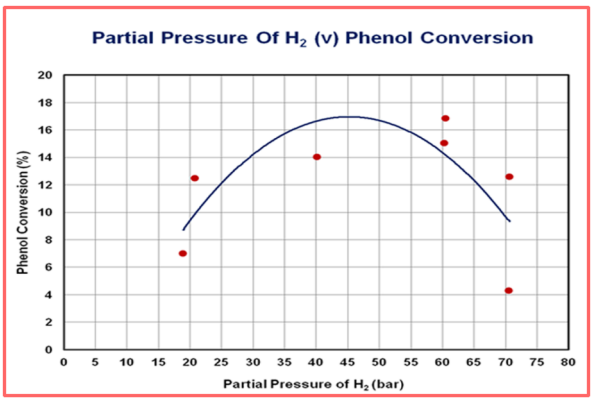
The recent surge of interest in flow chemistry among pharma companies has coincided with a renewed intensity in research within the petrochemical and refining sector. This has placed HEL in the unique position of being able to provide reactor solutions to these traditionally very different types of users. The search for new and better catalysts is a common theme though the chemistries are very different and include hydrogenation, polymerisation, oxidation, carbonylation and various high temperature oil conversion steps.

HEL has extended its well-known catalytic research platforms notably the HP ChemSCAN and FlowCAT, to much higher temperatures (e.g. 550°C and even higher in some cases) and pressures in excess of 200bar, to accommodate the needs of both these chemical sectors.

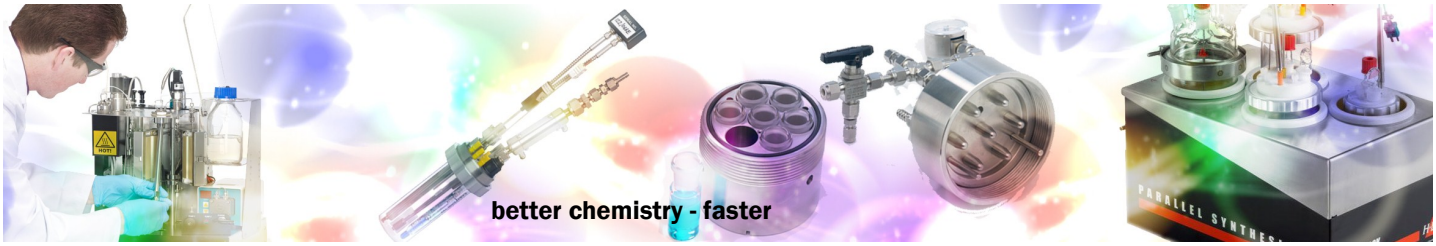
Adapting Catalytic Platforms For Greener Chemistry With $scCO_2$

Among the other potential benefits of moving to fixed bed flow reactors, is the ease with which benefits of supercritical CO_2 ($scCO_2$) can be investigated. HEL has been looking at the hydrogenation of phenol, both on stirred batch platforms (such as HP ChemSCAN) and FlowCAT. Starting with a process documented in the literature, we were able to replicate and extend this easily and quickly using the 8-reactor 200bar parallel stirred reactor system.

However, transferring this chemistry to a pressure trickle-bed flow mode proved troublesome and we therefore made modifications to make this easier. This revised method worked well in the FlowCAT giving an excellent yield but resulted in poor conversion in the batch reactor. Where the chemistry is more challenging and cannot be easily resolved with conventional solvents, $scCO_2$ is a common alternate and HEL's reactor systems can be adapted to this with suitable pumps for boosting CO_2 pressure being included.



*The graph shows some of the preliminary results for phenol hydrogenation in $scCO_2$ at a total working pressure of 80bar



HEL Group

UK HEAD OFFICE
HEL Ltd
9-10 Capital Business Park
Manor Way
Borehamwood, Herts
WD6 1GW, United Kingdom

Email: marketing@helgroup.com
URL: http://www.helgroup.com
Tel: +44 (0)20 8736 0640
Fax: +44 (0)20 8736 0641

US Office
HEL Inc
Princess Road Office Park,
Suite 208,
Lawrenceville, New Jersey,
Tel: +1 609 912 1551
Fax: +1 609 912 1552
E-Mail: info@hel-inc.com

China Offices
HEL Ltd.
Beijing Office
Rm A-301 LingLong World
No. 160 West 4th Ring North Road
HaiDian District
Beijing, PC 100142
Tel : +86-10-82101033
Fax: +86-10-82168022
E-Mail: info@helchina.com

Shanghai Office
Rm D-308, JinHong Industrial Park,
No.55 LuoJin Road, Shanghai
200237
TEL: +86(0)21 5417 3068
FAX: +86(0)21 5417 3065
E-Mail: info@helchina.com

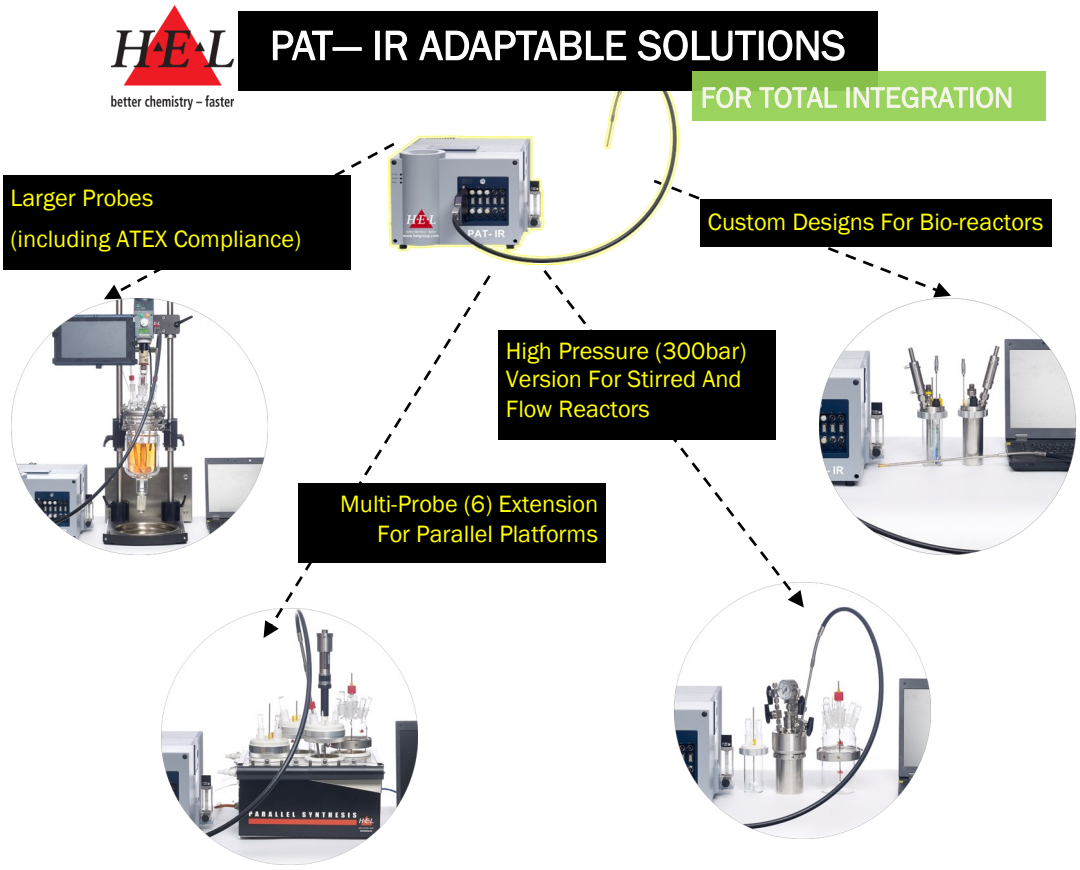
India Office
HEL India
Ghodbunder Road, Thane
Tel: +91-22-22927171
Fax: +91-22-25975116
Email: info@helindia.com

Hel.ltd
@heluk
Hel-ltd

better chemistry – faster

HEL PAT-IR

The Process-Ready FT-IR Spectrometer

Analytical Integration – From GC to FT-IR and PAT

PAT (Process Analytical Technology) is an important part of HEL's niche in relation to process development and quality control. We have FT-IR and Laser-based particle sizing probes available for a range of applications and scales as illustrated below.
The multiplexed FT-IR system (up to 6 probes from the same unit) is ideally suited to HEL's multi-reactor platforms.
A flow version of the same technology is also available and this can be extended to include feedback control based on real-time data.