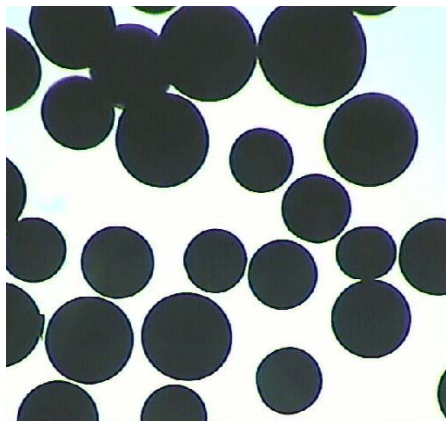


Pt(0) EnCat™

Encapsulated platinum(0) catalyst

Reaxa's Pt(0) EnCat™ catalyst incorporates platinum(0) within a porous polymer bead giving high selectivity with low levels of precious metal contamination in reduction reactions



The spherical nature of Pt(0) EnCat™ makes it ideally suited to continuous flow processes or batch methodologies

Cleaner products	typically less than 10 ppm Pt in crude reaction products
Cleaner waste streams	minimal metal losses in Pt EnCat™ processes
Fast, efficient processes	EnCat™ beads filter easily
No plant contamination	metal remains trapped within the polymer bead
Improved processes	high activity and selectivity in many types of reduction reactions
Process intensification	EnCat™ can be used in batch and continuous flow processes

Product	Sigma-Aldrich Catalogue #	Pt Metal Content % w/w	Pt Loading mmol/g	Particle Size Range µm (average)
Pt(0) EnCat™	681504	2.3	0.12	100-350 (200)

Microencapsulation – Improving catalyst handling

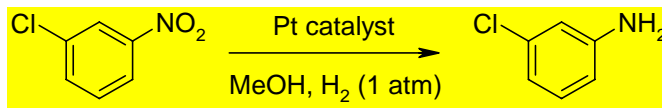
An important benefit of Pt(0) EnCat™ is its improved safety profile. The polyurea support is considerably less flammable than carbon while the encapsulation of the metal improves handling. On a small scale there has been no evidence of pyrophoricity, even when solvent wet catalyst is left to dry in air on a filter cloth following a hydrogenation reaction. A Pt/C sample could combust under analogous conditions

Pt(0) EnCat™ is spherical in nature and therefore ideally suited to continuous flow processes or batch methodologies

Pt(0) EnCat™

Applications

Highly selective hydrogenations of nitro groups with very low dechlorination



Catalyst (mol%)	Time (h)	Products (% conversion)		
		3-Chloro aniline	Aniline	Others
5% Pd/C (1)	0.5	1	96	3
5% Pt/C (5)	0.5	57	27	16
5% Pt/C (1)	0.5	84	11	5
Pt(0) EnCat™ (5)	0.5	94	6	0
Pt(0) EnCat™ (2)	1	93	7	0
Pt(0) EnCat™ (1)	1.5	90	10	0

Pt(0) EnCat™ facilitates enhanced selectivity when compared to Pt/C or Pd/C within hydrogenation procedures.

Reducing the loading of Pt(0) EnCat™ from 5 mol% to 1mol% still affords equivalent conversions (or greater) to Pt/C.

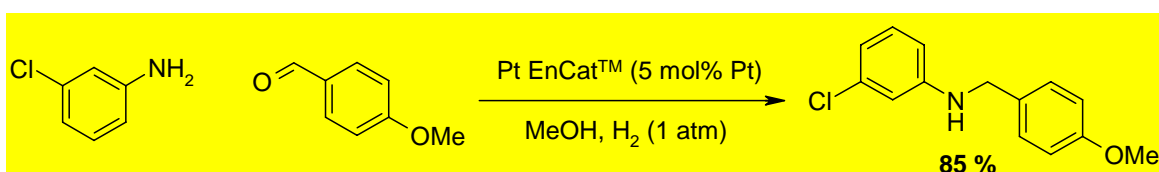
Recyclability of Pt(0) EnCat™

Run	1	2	3	4	5
Conversion (%)	100	100	100	100	100
Purity (%)	93	93	91	90	89
Time (h)	1	1	1	1	1.5

Encapsulation of Pt within polymer beads facilitates recovery & reuse of the catalyst.

Hydrogenation of 3-chloronitrobenzene with recycled Pt(0) EnCat™ demonstrated good consistency of yield and reaction time.

Highly selective reductive aminations



Pt(0) EnCat™ demonstrates selectivity in the reduction of imines over benzaldehydes. This can be extended to a “one-pot” approach combining a nitro reduction & reductive amination.

For more information about EnCat™ catalysts please visit: www.reaxa.com/encat
For EnCat™ samples and test kits please visit: www.reaxa.com/samples
For bulk quotations on EnCat™ products contact: info@reaxa.com

