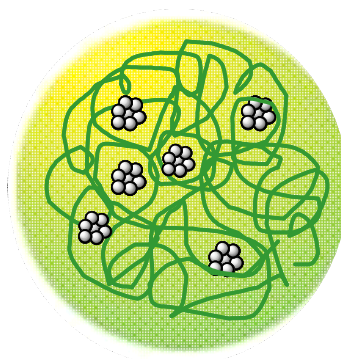
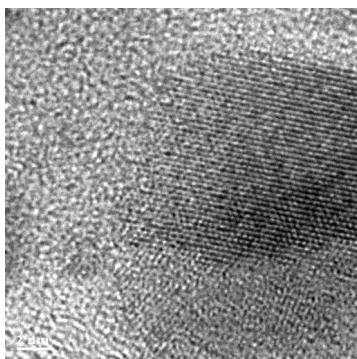


# Pd(0) EnCat™ 30NP

## Encapsulated Palladium Hydrogenation Catalyst

Pd(0) EnCat™ 30NP is a versatile polymer encapsulated nano-particulate Pd(0) hydrogenation catalyst with high chemoselectivity and improved safety profile allowing easier, faster and cleaner processes to be developed



Reaxa's controlled manufacturing process produces regular palladium (0) nano-particles stabilised by the polymer matrix within the EnCat™ beads, ensuring that the catalyst performance is extremely reproducible from batch to batch. Each metal particle is around 2 nm in diameter, approximately 10 atoms, giving a highly selective and active hydrogenation catalyst. The polymer matrix also helps to stabilise the catalyst in air, improving the safety profile compared with alternative palladium on carbon products.

Pd(0) EnCat™ 30NP is effective in reduction of a wide variety of substrates in each case giving extremely low levels of palladium contamination of the resulting products.

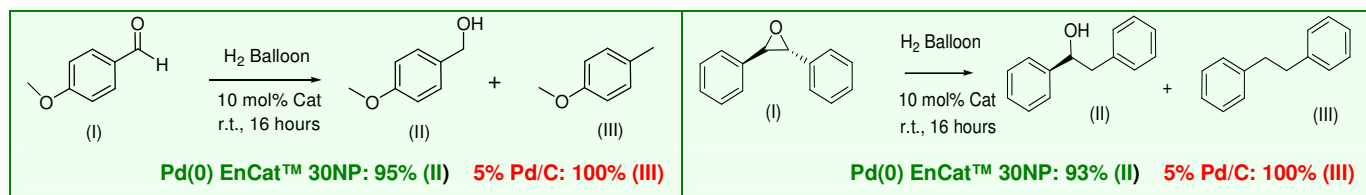
<b>Cleaner products</b>	typically less than 1 ppm Pd in crude product
<b>Cleaner waste streams</b>	reduced metal losses in EnCat™ processes
<b>Fast, efficient processes</b>	the EnCat™ beads filter easily
<b>No plant contamination</b>	palladium metal is trapped within the beads
<b>High selectivity</b>	in hydrogenation & transfer hydrogenation reactions
<b>Improved safety profile</b>	non-pyrophoric compared with Pd/C catalysts
<b>Process intensification</b>	can be used in batch & flow processes

<i>Product</i>	<i>Pd Metal Content w/w %</i>	<i>Pd Loading mmol/g</i>	<i>Particle Size Range µm (average)</i>
<b>Pd(0) EnCat™ 30NP</b>	<b>4.3</b>	<b>0.35 - 0.43</b>	<b>100 - 350 (200)</b>

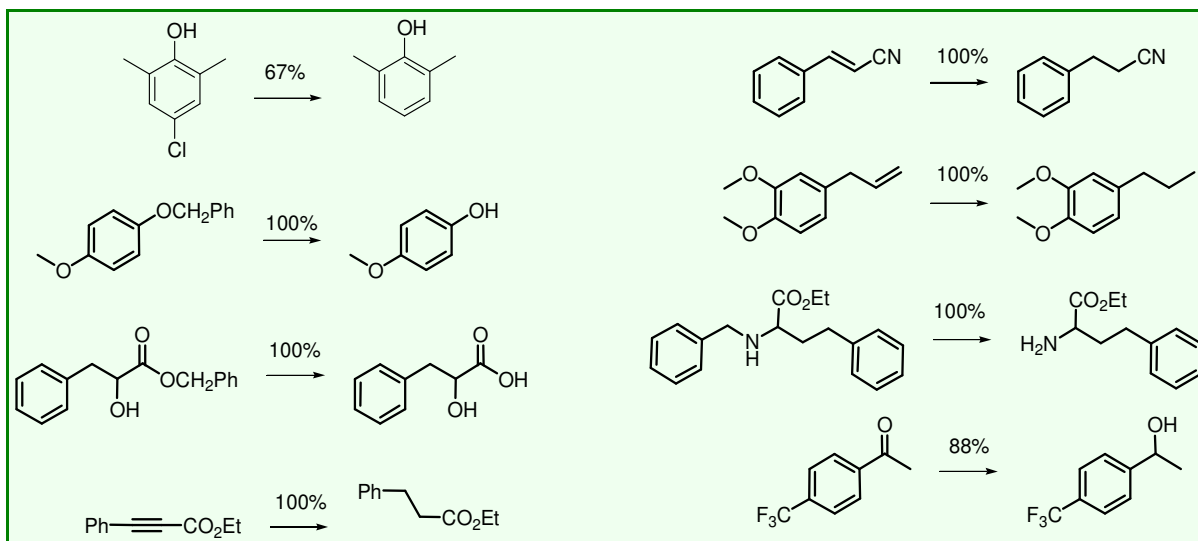


# Pd(0) EnCat™ 30NP Applications

## Highly Selective Hydrogenations:



## Reduction Examples:



General conditions: H<sub>2</sub> (balloon), 10 mol% Pd(0) EnCat™ 30NP, EtOH, rt, 16 h

## Example of Catalyst Re-use:

	5 mol% Pd(0) EnCat™ 30NP									
	Et <sub>3</sub> N, HCOOH, EtOAc, RT, 5 hr									
	99%									
Run	1	2	3	4	5	6	7	8	9	10
Time (h)	5	3	3	3	5	3	5	5	5	5
Yield (%)	99	91	76	96	92	93	98	97	97	92

## Selected References:

- N. Bremeyer, S.V. Ley, C. Ramarao, I.M. Shirley, S.C. Smith; *Synlett.*, **2002**, 11, 1843.
- J-Q. Yu; H-C. Wu, C. Ramarao, J.B. Spencer, S.V. Ley; *Chem. Comm.*, **2003**, 678.
- S.V. Ley, C. Mitchell, D. Pears, C. Ramarao, J-Q. Yu, W. Zhou; *Org. Lett.*, **2003**, 5, 4665.

**R&D quantities of Pd(0) EnCat™ 30NP are available from Sigma-Aldrich at:  
www.sigma-aldrich.com**

**For technical support, bulk quotations & information on Pd(0) EnCat™ 30NP please contact:  
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