**Benefits**

- Better kinetics between reactants and the actual catalyst, enabled by broader particle size distribution
- Faster transport of reactants in and out the pores with higher mesoporosity
- Less precious metal is required for the same catalytic activity due to the finer dispersion of catalyst over a large surface from our unique surface chemistry and high mesoporosity
- Lower catalyst and precious metal loss due to high crush strength and a low abrasion index
- Catalyst poisoning is avoided and catalyst life is extended with high purity

**Challenge and solution**

Most chemical processes require a catalyst, making them of vital importance in pharmaceutical and fine chemical industrial applications. Precious metals are used as catalysts in various chemical reactions and catalyst demand is being driven by increasing environmental regulations, more efficient use of raw materials and industry growth. Activated carbon is a material that has all the required characteristics to be used as a catalyst support when compared to other carriers, like silica or alumina, activated carbons provide:

- Greater internal surface area and lowest cost per cubic meter
- Stable inertness in harsh process conditions such as acidic and alkaline solutions
- No interference with selectivity or activity
- Availability in powdered, granular and extruded shapes
- Easy recovery of precious metals

When designing precious metal catalysts for use in various chemical reactions, a carrier is often required to disperse the metal catalyst over a wide surface area. Cabot Norit® activated carbon is an ideal carrier material by providing access to much more catalytically active atoms compared to the bulk metal and can be appropriately selected to obtain the best compromise between activity and selectivity.

**Our activated carbon product portfolio for precious metal catalyst carrier applications**

We offer a wide product portfolio of Powdered Activated Carbon (PAC), Granular Activated Carbon (GAC) and Extruded Activated Carbon (EAC) that comply with ISO 9001:2008 quality control standards and address the requirements of manufacturing carbon supported precious metal catalysts (e.g. palladium, platinum, iridium, ruthenium, rhodium and gold), used in versatile liquid phase chemical reactions, including:

- Hydrogenation
- Reductive acylation/amination
- Carbon-oxygen/nitrogen cleavage
- Hydrodehalogenation
- Decarbonylation
- Disproportionation
- Dehydrogenation
- Oxidation
- Dehydrohalogenation
- Debenzylation
- Hydroxylamine synthesis
- Electrocatalysis
Our activated carbon product portfolio for the precious metal catalyst carrier market

<table>
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<th>Filterability</th>
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</table>

More about Powdered Activated Carbons

Kinetics and filterability can be controlled by particle size distribution. A broader distribution provides better kinetics between reactants and catalyst. A narrow distribution will provide faster filtration but sacrificing suspension characteristics.

Catalyst activities can be optimized by high meso porosity and unique surface chemistry which enable a higher surface area, finer dispersion of metal catalyst particles, faster flow of reactants in and out the pores, and eventually better adsorption of unwanted byproducts.

Side reactions can be minimized by high purity of the activated carbon which prevents side reactions or poisoning of the catalyst.

More about Granular and Extruded Activated Carbons

Metal loss can be minimized by high crushing strength and high hardness of activated carbons. Both properties prevent collapse of the carbon bed by high pressure and result in low abrasion to avoid fines being introduced into catalyst.

Longer catalyst life can be achieved by overcoming poisoning of the actual catalyst and higher yield can be achieved by higher purity minimizing side reactions.

Higher activity can be achieved by the larger surface area of higher meso porosity. In this situation the "egg shell" metal catalyst is mainly dispersed on the outside of the carbon particle.

Our sales, technical service and customer service teams are prepared to serve customers around the world. Contact us at cabotcorp.com/activatedcarboncontact

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