

PROCAT - NEOCAT

Catalyst Application Guide

Our Precious Metal (Heterogeneous) Grades:

Applications	Palladium Catalysts	Platinum Catalysts	Ruthenium Catalysts	Rhodium Catalysts
Hydrogenation of Nitro (-NO₂)				
Aromatic Nitro to Amines	NCAT 1110-2, NCAT 1110-5, NCAT 1110-10, NCAT 1110-20 (Pearlman's catalyst)	NCAT 2423-1, NCAT 2231-3, NCAT 2323-3, NCAT 2241-5, NCAT 2221-3, NCAT 2221-5, NCAT 2221AS-5		
Aromatic Nitro in Halonitroaromatics	NCAT 1121-1, NCAT 1121-2, NCAT 1121-5, NCAT 1121-5	NCAT 2423-1, NCAT 2231-3, NCAT 2323-3, NCAT 2241-5, NCAT 8120-1		
Aromatic Nitro with Other Functional Groups	NCAT 1110-2, NCAT 1110-5, NCAT 1110-10, NCAT 1110-20	NCAT 8120-1		
Aromatic Nitro to Hydroxylamines	NCAT 1110-2	NCAT 1110-2		
Aromatic Nitro to para-Aminophenols	NCAT 1611-1, NCAT 1611-3	NCAT 8120-1		
Hydrogenation of Aliphatic Nitro Groups	NCAT 1110-2, NCAT 1110-5, NCAT 1110-10, NCAT 1110-20	NCAT 2423-1		
Hydrogenation of CC Bonds				
Hydrogenation of CC Double Bonds	NCAT 1110-2, NCAT 1110-5, NCAT 1110-10, NCAT 1611-0.3, NCAT 1110-20	NCAT 2423-1, NCAT 2231-3, NCAT 2323-3, NCAT 2241-5, NCAT 2622-1	NCAT 3111-3, NCAT 3111-5	NCAT 4111-5
Hydrogenation of CC Triple Bonds to Aliphatics	NCAT 1110-2, NCAT 1110-5, NCAT 1110-10, NCAT 1110-20	NCAT 2423-1, NCAT 2231-3, NCAT 2323-3, NCAT 2241-5, NCAT 2622-1		NCAT 4111-5
Hydrogenation of CC Triple Bonds to CC Double Bonds	NCAT 1110-2, NCAT 1110-5, NCAT 1110-10, NCAT 1110-20, NCAT 1834-5, NCAT 1834-5L	NCAT 2423-1, NCAT 2231-3, NCAT 2323-3, NCAT 2241-5, NCAT 2622-1, 5%Pd/CaCO ₃		
Hydrogenation of Nitrile (C≡N)				
Hydrogenation of Nitrile to Primary Amines	NCAT 1171-5, NCAT 1172-5, NCAT 1130-5, NCAT 1134-5, NCAT 1230-2.5, NCAT 1230	NCAT 2241-5		NCAT 4111-5
Nitrile to Secondary and Tertiary Amines	NCAT 1171-5, NCAT 1172-5, NCAT 1130-5, NCAT 1134-5, NCAT 1230-2.5, NCAT 1230	NCAT 2223-5, NCAT 2223-3		NCAT 4111-5
Hydrogenation of CN Triple Bonds to Aldehydes	NCAT 1171-5, NCAT 1172-5, NCAT 1130-5, NCAT 1134-5, NCAT 1230-2.5, NCAT 1230	NCAT 2223-1		
Hydrogenation of CN Double Bonds (imines) to Amine	NCAT 1171-5, NCAT 1172-5, NCAT 1130-5, NCAT 1134-5, NCAT 1230-2.5, NCAT 1230, NCAT 1834-5 (5%Pd/CaCO ₃)	NCAT 2223-3, NCAT 2223-5, NCAT 2221-3, NCAT 2221-5		NCAT 4111-5
Hydrogenation of Hydrazones to Hydrazines	NCAT 1171-5, NCAT 1172-5, NCAT 1130-5, NCAT 1134-5, NCAT 1230-2.5, NCAT 1230			
Hydrogenation of Carbonyl (C=O)				
Hydrogenation of Aliphatic Aldehydes and Ketones	NCAT 1611-0.3, NCAT 1611-0.5, NCAT 1611-1, NCAT 1611-3	NCAT 2423-1, NCAT 2231-3, NCAT 2323-3, NCAT 2241-5, NCAT 2622-1		
Hydrogenation of Sugars to sugar alcohols	NCAT 1611-0.3, NCAT 1611-0.5, NCAT 1611-1, NCAT 1611-3	NCAT 2423-1, NCAT 2231-3, NCAT 2323-3, NCAT 2241-5, NCAT 2622-1		
Hydrogenation of Aromatic Carbonyls to Alcohols	NCAT 1121-1, NCAT 1121-2, NCAT 1121-5, NCAT 1121-10	NCAT 2123-5	NCAT 3111-5, NCAT 3111-3	
Hydrogenation of Aromatic Carbonyls to Alkyls	NCAT 1171-5, NCAT 1172-5, NCAT 1130-5, NCAT 1134-5, NCAT 1230-2.5, NCAT 1230, NCAT 1834-5 (5%Pd/CaCO ₃)	NCAT 2123-5	NCAT 3111-5, NCAT 3111-3	

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Hydrogenolysis Reaction				
O-Debenzylation (Cleavage of the Carbon-Oxygen Bond)	NCAT 1140-5, NCAT 1110-5, NCAT 1121-5			
N-Debenzylation (Cleavage of the Carbon-Nitrogen Bond)	NCAT 1140-5, NCAT 1110-5, NCAT 1121-5			
Removal of the Cbz (Z) Protection Group	NCAT 1142-5, NCAT 1172-5			
Hydrodehalogenation of Aliphatics	NCAT 1134-5			
Rosenmund Reduction*	NCAT 1834-5			
Hydrodehalogenation of Aromatics	NCAT 1121-2			
Reductive Alkylation and Amination				
Aldehydes and Ketones to Primary Amines	NCAT 1110-5, NCAT 1110-10, NCAT 1140-10	NCAT 2221-3, NCAT 2221-5, NCAT 2221AS-5		
Aldehydes and Ketones to Secondary Amines	NCAT 1143-5, NCAT 1140-5	NCAT 2221-3, NCAT 2221-5, NCAT 2221AS-5		
Hydrogenation of Aromatics				
Hydrogenation of Heteroaromatics	NCAT 1130-5			NCAT 4111-5
Hydrogenation of Aromatics (partial)	NCAT 1121-5	NCAT 2223-5, NCAT 2241-5	NCAT 3111-5	NCAT 4111-5
Hydrogenation of Aromatics (total)	NCAT 1110-10	NCAT 2241-5, NCAT 2221-5	NCAT 3111-5	NCAT 4111-5
Dehydrogenation and Oxidations				
Dehydrogenation of Carbocyclic rings to aromatics	NCAT 1110-10, NCAT 1140-10		NCAT 3111-5, NCAT 3611-5	NCAT 4111-5
Oxidation of Alcohols and Sugars	NCAT 1110-5		NCAT 3111-5, NCAT 3611-5	
CC Coupling Reactions				
Heck Coupling, Suzuki Coupling	NCAT 1142-5, NCAT 1243-5			
Epoxide Ring Hydrogenations				
Epoxide to primary Alcohol	NCAT 1110-10, NCAT 1140-10, NCAT 1110-5			

Our Skeletal Nickel Catalyst Grades (Raney type):

Functional Group	Applications	Recommended Skeletal Nickel Catalysts (Raney Type)
Hydrogenation of Nitro(NO ₂)	Aromatic Nitro to Amines Aromatic Nitro in Halonitroaromatics Hydrogenation of Aliphatic Nitro Groups	SNC 1211 SNC 3211
Hydrogenation of CC Bonds	Hydrogenation of CC Double Bonds/CC Triple Bonds	SNC 1211 SNC 2211 SNC 3211
Hydrogenation of Nitrile(C≡N)	Hydrogenation of Nitrile to Primary Amines Nitrile to Secondary and Tertiary Amines Hydrogenation of CN Triple Bonds to Aldehydes	SNC 4211 SNC 8211 SNC 7211
Hydrogenation of Carbonyl (C=O)	Hydrogenation of Aliphatic Aldehydes and Ketones Hydrogenation of Sugars to sugar alcohols Hydrogenation of Aromatic Carbonyls to Alcohols	SNC 4211 SNC 8211 SNC 6211
Hydrogenolysis Reactions	Dehalogenation of Aromatics Dehalogenation of Aliphatics	SNC 1211 SNC 4211
Reductive Alkylation and Amination	Imine to Primary Amines Imine to Secondary Amines	SNC 1211 SNC 3211
Hydrogenation of Aromatics	Hydrogenation of Heterocyclic ring Hydrogenation of Aromatics (total)	SNC 8211 SNC 1211 SNC 3211
Dehydrogenations and Oxidations	Dehydrogenation of Carbocyclic rings to aromatics Oxidation of Alcohols and Sugars	SNC 1211 SNC 6211 SNC 7211

Further, we have Mixed Metal Oxide Catalysts for specific hydrogenation needs:

Application	Recommended MMO Catalysts
Reduction /Fatty Ester to Fatty Alcohol	PROCAT™ CR3P
Selective hydrogenation / Hydrogenation of Menthone to Menthol	PROCAT™ CR4P PROCAT™ CR4T
N-Alkylation /For Alkylation of Amine to produce mono alkylated product Aniline + menthol to N(CH ₃) ₂	PROCAT™ CR15T
Selective Hydrogenation /Hydrogenation of Ketone/without affecting double bond CO=CHOH	PROCAT™ CS0P
Decarboxylation Dehydration / Propionic acid to Diethyl Ketone	PROCAT™ DHC0E PROCAT™ DHC0T