



**VINEETH PRECIOUS
CATALYSTS PVT. LTD.**

PRODUCT CATALOGUE

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	Product	CAS No.	Recommended Application
01	Raney Nickel Catalyst (Active)	12635-27-7	A versatile Hydrogenation Catalyst that can carry out almost all types of hydrogenation reactions and can also be used for dehydrogenation and desulphurisation.
02	Raney Copper Catalyst	7440-50-8	Used for oxidation of diethanol amine to iminodiacetic acid.
03	Raney Cobalt Catalyst	7440-48-4	Used for selective hydrogenation of unsaturated Nitrile to unsaturated Amine and reduction of di-nitriles to di-amines.
04	Palladium on Activated Charcoal(Carbon) Pd Content: 1%, 2%, 2.5%, 3%, 5%, 10% etc. DRY or 50% L.O. D	7440-05-3	Hydrogenation of Alkene to Alkane, Aldehyde/ Ketone to alcohol, Nitro compound to Amino compound, Oxime to Amine etc.
05	Palladium on Calcium Carbonate Pd Content: 1%,2%,2.5%, 3%,5%,10% etc.	7440-05-3	Hydrogenation of Alkyne to Alkene.
06	Palladium on Barium Sulphate Pd Content: 1%,2%,2.5%, 3%,5%,10% etc.	7440-05-3	Hydrogenation of Alkyne to Alkene, Aromatic halides to hydrocarbons (dehalogenation)
07	Palladium on Spherical Alumina Balls Pd Content: 0.1% to 5% Ball Size: 3mm to 5mm As Per Customer's Specifications	7440-05-3	Vapor phase hydrogenation catalyst.
08	Lindlar catalyst (Palladium on Calcium Carbonate partially deactivated by Lead)	7440-05-3	Used for selective hydrogenation of Triple bond (Acetylenic Bond) to double bond without carrying out further reduction to paraffin. By using this catalyst, reduction terminates at olefin level only.

09	20% Palladium Hydroxide on Carbon (Pd Content: 15.2%)	12135-22-7	Debenzylation
10	Pearlman's Catalyst (Pd Content: 20%)	12135-22-7	Debenzylation at low temperature, low pressure
11	Platinum on Activated Charcoal (Carbon) Pt Content: 1%, 2%, 3%, 5%, 10% etc. DRY or 50% L.O.D.	7440-06-4	A powerful hydrogenation catalyst, useful where the reaction conditions may be highly acidic in nature. Pyridine ring hydrogenations, Aromatic ring hydrogenation, Reduction of chlorinated nitro aromatic compounds without loss of chlorine atoms. Reduction of Schiff's base. Reduction of Aliphatic and Aromatic nitro compounds.
12	Platinum (II) Oxide, Adams Catalyst, PtO₂ Snuff coloured powder, Pt Content: ~84%	1314-15-4	Ring hydrogenation at low temperature and pressure. Asymmetric (optically active) hydrogenation
13	Ruthenium on Carbon Ru Content: 1%, 2%, 3%, 5%, 10% etc. DRY or with 50% L.O. D	7440-18-8	Selective hydrogenation of Aliphatic Aldehydes and Ketones. Ring hydrogenation
14	Nickel-Aluminium Alloy Powder (50:50)	12635-27-7	Used as an in-situ hydrogenation catalyst at ambient pressure (Open Vessel Hydrogenation)
15	Nickel-Aluminium Alloy Powder (30:70)	12635-27-7	Used as an in-situ hydrogenation catalyst at ambient pressure (Open Vessel Hydrogenation)
16	Devardas Alloy Copper :50% Aluminium: 45% Zinc: 5%	8049-11-4	Reduction of Nitrogen carrying compounds to Ammonia.

Precious Metal Compounds

	Product	CAS No.	Appearance	Formula	Precious Metal Content
01	Palladium Black	7440-05-3	Black powder	Pd	Pd> 99%
02	Palladium (II) Oxide	1314-08-5	Dark snuff coloured powder	PdO	Pd>85%
03	Palladium (II) Chloride	7647-10-1	Brick red powder	PdCl ₂	Pd> 59.5%
04	Palladium Acetate, Trimer	3375-31-3	Orange brown coloured crystalline powder	[Pd(CH ₃ COO) ₂] ₃	Pd> 47%
05	Diamine DichloroPalladium	14323-43-4	Bright yellow coloured powder	Pd(NH ₃) ₂ Cl ₂	Pd~ 50%
06	Diaminedinitrito Palladium(II)	14708-52-2	Lemon Yellow Powder (Palladium 'P' salt)	Pd(NO ₂) ₂ (NH ₃) ₂	Pd~36%
07	Tetrakis (triphenyl phosphine) palladium (0)	14221-01-3	Yellow crystals	[Pd(PPh ₃) ₄]	Pd~9.2%
08	Bis (triphenyl phosphine) palladium (II) dichloride	13965-03-2	Pale yellow coloured waxy powder	[(C ₆ H ₅) ₃ P] ₂ PdCl ₂	Pd~ 15%

09	Diacetate bis (triphenyl phosphine) Pd (II)	14588-08-0	Yellow powder	$[\text{Pd}(\text{OAc})_2(\text{PPh}_3)_2]$	Pd~ 14.2%
10	Potassium Tetrachloroplatinate (II)	10025-99-7	Bright red crystals, water soluble	$\text{K}_2[\text{PtCl}_4]$	Pt~ 47%
11	Potassium Hexachloroplatinate (IV)	16921-30-5	Yellow powder, sparingly soluble in water	$\text{K}_2[\text{PtCl}_6]$	Pt~ 40%
12	Chloroplatinic Acid	16941-12-1	Orange mass	$\text{H}_2\text{PtCl}_6 \times \text{H}_2\text{O}$	Pt~ 40%
13	Ruthenium trichloride Hydrate	14898-67-0	Shining black crystals, water soluble	$\text{RuCl}_3 \times \text{H}_2\text{O}$	Ru~ 40%
14	Silver on Spherical Alumina Balls Ball size 3mm to 5mm As per customer's specification	7440-22-4			Silver ~5%

Note:

- Palladium on other inert support materials viz. silica, kieselguhr, asbestos etc. can be supplied against specific request.
- We also undertake **Reprocessing / Recovery job work** of spent Palladium / Platinum catalysts and also **Reactivation of Spent Raney Nickel Catalysts**.
- Some of the hydrogenation catalysts are also known to be used as dehydrogenation catalysts in certain reactions under special reaction conditions.

Specialized Palladium Products

	Products with Alternate names, Molecular Formula & Molecular Weight	CAS No.	Appearance	Minimum Pd content
01	Bis (benzotrile) dichloropalladium(II) Mol. Formula: $(C_6H_5CN)_2PdCl_2$ Mol. Weight: 383.57	14220-64-5	Yellow coloured compound	27.4 %
02	Dichloro bis (acetonitrile) palladium (II) Mol. Formula: $[PdCl_2(CH_3CN)_2]$ Mol. Weight: 259.5	14592-56-4	Dark yellow powder	40.6 %
03	Bis (acetylacetonato) palladium (II) Mol. Formula: $[Pd(acac)_2]$ Mol. Weight: 304	14024-61-4	Yellow orange solid/ powder	34.7 %
04	Dibenzylidene-acetone <i>Alternative Name:</i> (dibenzylideneacetone) Mol. Formula : $C_{17}H_{14}O$ Mol. Weight: 234.3 This is an intermediate product for Bis (dibenzylidene acetone) Pd (0)	35225-79-7	Yellow shiny crystalline powder	No Pd metal in this product
05	Bis(dibenzylideneacetone)palladium (0) <i>Alternative Name:</i> palladium (0) bis(dibenzylideneacetone) Mol. Formula: $(C_{17}H_{14}O)_2 Pd$	52409-22-0	Reddish brown powder	18.3%
06	Tris(dibenzylideneacetone) dipalladium (0) Synonym: $Pd_2(dba)_3$ <i>Alternative Name:</i> dipalladium-tris(dibenzylideneacetone) Mol. Formula: $C_{51}H_{42}O_3Pd_2$ Mol. Weight: 915.72	51364-51-3	Purple powder	21.5 %
07	Tris(dibenzylideneacetone) dipalladium (0) -Chloroform <i>Alternative Name:</i> dipalladium-tris(dibenzylideneacetone) chloroform complex Mol. Formula: $C_{51}H_{42}O_3Pd_2 CHCl_3$ Mol. Weight: 1035	52522-40-4	Purple solid / powder	20.3 %

08	Bis (triphenyl phosphine) dichloro palladium (II) Mol. Formula: $[PdCl_2\{PPh_3\}_2]$ Mol. Weight: 701	13965-03-2	Yellow solid	15.0 %
09	[1,1- bis (diphenyl phosphino) ferrocene] dichloro palladium (II) dichloromethane adduct Mol. Formula: $[Pd\{dppf\}Cl_2] CH_2Cl_2$ $Pd\{Ph_2PC_5H_4FeC_5H_4PPh_2\} Cl_2.CH_2Cl_2$ Mol. Weight: 816	95464- 05-4	Orange / red solid	12.8 %
10	[1,1-bis (diphenyl phosphino) ferrocene] dichloro palladium (II) Mol. Formula: $[Pd\{dppf\}Cl_2]$ Mol. Weight: 731.71	72287-26-4	Brick red solid	14.2 %
11	[1,1-bis (diphenyl phosphino) ferrocene] dichloro palladium (II) acetone adduct Mol. Formula: $[Pd\{dppf\}Cl_2] \{CH_3\}_2 CO$ $Pd \{Ph_2PC_5H_4FeC_5H_4PPh_2\} Cl_2 \{CH_3\}_2 CO$ Mol. Weight: 789	851232-71-8	Brick red solid	13.2 %
12	Palladium Acetate, trimer or Palladous Acetate, trimer Mol. Formula : $[Pd (CH_3 COO)_2]_3$ Mol. Weight for trimer : 673.46	3375-31-3	Dark orange solid or Red brown crystal	47.2 %
13	Dichloro bis (di tert. butyl phenyl phosphine) palladium (II) Mol. Formula: $[C_6H_5 P \{C (CH_3)_3\}_2]_2 PdCl_2$ or $C_{28}H_{46}P_2PdCl_2$ Mol. Weight: 621.94	34409-44-4	Pale yellow to dark yellow powder	16.9 %
14	1,4 - Bis(diphenylphosphino) butane-palladium (II) chloride Empirical Formula: $C_{28}H_{28}Cl_2P_2Pd$ Mol. Formula: $PdCl_2(dppb)$ Mol. Weight: 603.80	29964-62-3	Light yellow solid/ crystals/ powder	17.0 %

15	Tetrakis(Triphenyl Phosphine) Palladium (0) Mol. Formula: Pd[Ph ₃ P] ₄ Empirical Formula: C ₇₂ H ₆₀ P ₄ Pd Mol. Weight: 1155	14221-01-3	Greenish Yellow to Golden Yellow soft crystalline powder	9%
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Grades of Raney Nickel Catalyst (Active) and their Typical Applications

Grades	Applications
RNP	<ul style="list-style-type: none"> ✓ Nitro to amino ✓ Oxime to amine ✓ Carbonyl to alcohol ✓ Debenzylation ring hydrogenation
RNM	<ul style="list-style-type: none"> ✓ Aldehyde to alcohol ✓ Saturation of olefinic double bond
RNK	<ul style="list-style-type: none"> ✓ Dehydrogenation (can withstand high temp for longer period)
RNK-F	<ul style="list-style-type: none"> ✓ Dextrose to sorbitol ✓ Nitriles to amines with higher recycles ✓ Ammonolysis of alcohol (1, 6 Hexanediol to hexamethylene diamine)

Special Grades of Raney Nickel with Promoters/ Raney Nickel catalyst for Desulphurization
[Tailor made catalysts specific to the reaction can also be supplied against specific request]

Palladium on Carbon Catalysts & their Typical Applications

Catalyst Grade	Palladium Content	Typical Application
300Z	2.0 %, 2.5%, 3.0%, 5.0%	<ul style="list-style-type: none"> ✓ Carbonyl reduction ✓ Dehalogenation C-N and C-O cleavage ✓ Aromatic and aliphatic nitro/ nitroso group hydrogenation
300V	2.0%, 2.5%, 3.0%, 5.0%	<ul style="list-style-type: none"> ✓ C-N and C-O cleavage ✓ Reduction of Olefins to Paraffin's ✓ Debenzylation
390Z	2.0%, 2.5%, 3.0%, 5.0%, 10.0%	<ul style="list-style-type: none"> ✓ Rosenmund reduction ✓ Rosin disproportionation ✓ Dehalogenation ✓ Reductive alkylation/ amination aromatic nitro group hydrogenation ✓ Hydrogenation of acetylene and olefins to Paraffin ✓ Hydrogenation of aromatic aldehyde and ketones to alcohol
390V	2.0%, 2.5%, 3.0%, 5.0%, 10.0%	<ul style="list-style-type: none"> ✓ Debenzylation ✓ Dehydrogenation
153V	20% Pd (OH) ₂ carbon (Palladium content: 15.2%)	<ul style="list-style-type: none"> ✓ Debenzylation
Pearlman's Catalyst	Palladium content: 20%	<ul style="list-style-type: none"> ✓ Debenzylation at low temperatures and low pressure

Note:

- Different Grade No's of catalysts are on account of different grades of activated charcoal used and different techniques adopted at the time of making the catalyst.
- All the above Catalysts can also be supplied in wet form with 50% water.