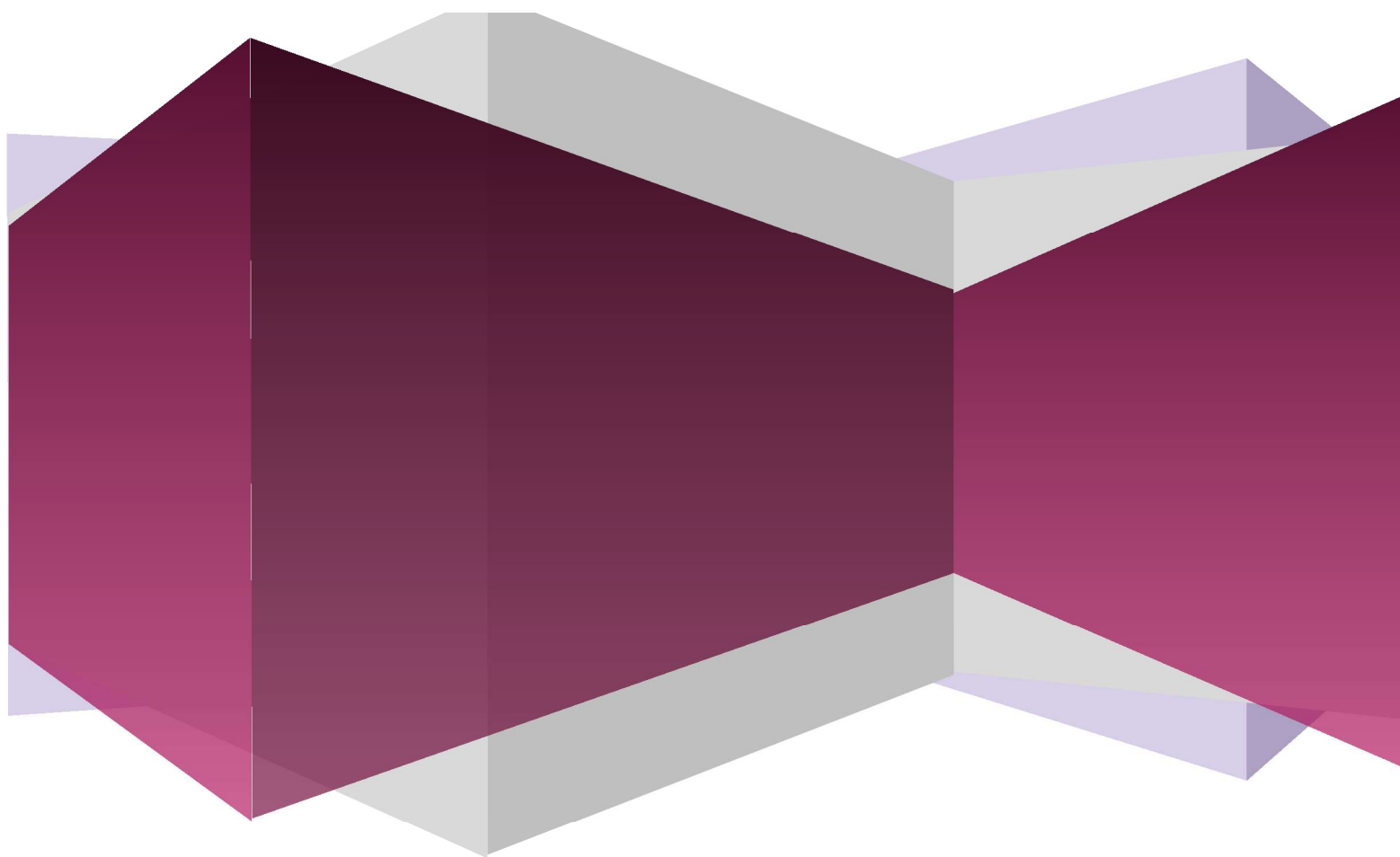




# VINEETH PRECIOUS CATALYSTS PRIVATE LIMITED

## PRODUCT CATALOGUE



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**Product List**

Sr. No.	Product	CAS No.	Recommended Application
01	<b>Raney Nickel Catalyst (Active)</b>	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	<b>Raney Copper Catalyst</b>	7440-50-8	Used for oxidation of diethanol amine to iminodiacetic acid.
03	<b>Raney Cobalt Catalyst</b>	7440-48-4	Used for selective hydrogenation of unsaturated nitrile to unsaturated amine and reduction of di-nitriles to di-amines.
04	<b>Palladium on Activated Charcoal (Carbon)</b> 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	<b>Palladium on Calcium Carbonate</b> Pd Content: 1%,2%,2.5%, 3%,5%,10% etc.	7440-05-3	Hydrogenation of alkyne to alkene.
06	<b>Palladium on Barium Sulphate</b> Pd Content: 1%,2%,2.5%, 3%,5%,10% etc.	7440-05-3	Hydrogenation of alkyne to alkene, aromatic halides to hydrocarbons (dehalogenation).
07	<b>Palladium on Spherical Alumina Balls</b> Pd Content: 0.1% to 5% Ball Size: 3 mm to 5mm as per Customers Specifications	7440-05-3	Vapor phase hydrogenation catalyst.
08	<b>Lindlar catalyst</b> (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	<b>20% Palladium Hydroxide on Carbon</b> (Pd Content: 15.2%)	12135-22-7	Debenzylation.
10	<b>Pearlman's Catalyst</b> (Pd Content: 20%)	12135-22-7	Debenzylation at low temperature, low pressure.
11	<b>Platinum on Activated Charcoal (Carbon)</b> 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 hydrogenation, aromatic ring hydrogenation and reduction of chlorinated nitro aromatic compounds without loss of chlorine atoms. Reduction of Schiff's base. Reduction of aliphatic and aromatic nitro compounds.
12	<b>Platinum (II) Oxide, Adams Catalyst, PtO<sub>2</sub> Snuff coloured powder,</b> Pt Content: 84%	1314-15-4	Ring hydrogenation at low temperature and pressure. Asymmetric (optically active) hydrogenation.
13	<b>Ruthenium on Carbon</b> Ru Content: 1%, 2%,3%,5%,10% etc. Dry or 50% L.O.D	7440-18-8	Selective hydrogenation of aliphatic aldehydes and ketones. Ring hydrogenation.
14	<b>Nickel-Aluminium Alloy Powder (50:50)</b>	12635-27-7	Used as an in-situ hydrogenation catalyst at ambient pressure (open vessel hydrogenation).
15	<b>Devardas Alloy</b> Copper 50% , Aluminium 45%, Zinc 5%	8049-11-4	Reduction of nitrogen carrying compounds to ammonia.

Precious Metal Compounds

Sr. No.	Product	CAS No.	Appearance	Formula	Precious Metal Content
01	<b>Palladium Black</b>	7440-05-3	Black powder	Pd	Pd: 99%
02	<b>Palladium (II) Oxide</b>	1314-08-5	Dark snuff coloured powder	PdO	Pd: 85%
03	<b>Palladium (II) Chloride</b>	7647-10-1	Brick red powder	PdCl <sub>2</sub>	Pd: 59.5%
04	<b>Palladium Acetate, Trimer</b>	3375-31-3	Orange brown coloured crystalline powder	[Pd(CH <sub>3</sub> COO) <sub>2</sub> ] <sub>3</sub>	Pd: 47%
05	<b>Palladium Nitrate</b>	10102-05-3	Reddish brown solution	Pd(NO <sub>3</sub> ) <sub>2</sub> x H <sub>2</sub> O	Pd Content: As per customers specification
06	<b>Diaminedichloro Palladium</b>	14323-43-4	Bright yellow coloured powder	Pd(NH <sub>3</sub> ) <sub>2</sub> Cl <sub>2</sub>	Pd: 50%
07	<b>Diaminedinitrito Palladium(II)</b>	14708-52-2	Lemon yellow Powder (Palladium 'P' salt)	Pd(NO <sub>2</sub> ) <sub>2</sub> (NH <sub>3</sub> ) <sub>2</sub>	Pd: 46%
08	<b>Bis (triphenyl phosphine) palladium (II) dichloride</b>	13965-03-2	Pale yellow coloured waxy powder	[(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> P] <sub>2</sub> PdCl <sub>2</sub>	Pd: 15%
09	<b>Diacetate bis (triphenyl phosphine) Pd (II)</b>	14588-08-0	Yellow powder	[Pd(OAc) <sub>2</sub> (PPh <sub>3</sub> ) <sub>2</sub> ]	Pd: 14.2%
10	<b>Potassium Tetrachloroplatinate (II)</b>	10025-99-7	Bright red crystals, water soluble	K <sub>2</sub> [PtCl <sub>4</sub> ]	Pt: 47%
11	<b>Potassium Hexachloroplatinate (IV)</b>	16921-30-5	Yellow powder, sparingly soluble in water	K <sub>2</sub> [PtCl <sub>6</sub> ]	Pt: 40%
12	<b>Chloroplatinic Acid</b>	16941-12-1	Orange mass	H <sub>2</sub> PtCl <sub>6</sub> x H <sub>2</sub> O	Pt: 40%
13	<b>Platinum (IV) Chloride</b>	13454-96-1	Orange powder	PtCl <sub>4</sub>	Pt: 55%
14	<b>Ruthenium trichloride Hydrate</b>	14898-67-0	Shining black crystals, water soluble	RuCl <sub>3</sub> x H <sub>2</sub> O	Ru: 40%

**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

Sr. No.	Products with Alternate names, Molecular Formula & Molecular Weight	CAS No.	Appearance	Minimum Pd content
01	<b>Bis (benzonitrile) dichloropalladium(II)</b> Mol. Formula: $(C_6H_5CN)_2PdCl_2$ Mol. Weight: 383.57	14220-64-5	Yellow coloured compound	27.4 %
02	<b>Dichloro bis (acetonitrile) palladium (II)</b> Mol. Formula: $[PdCl_2(CH_3CN)_2]$ Mol. Weight: 259.5	14592-56-4	Dark yellow powder	40.6 %
03	<b>Bis (acetylacetonato) palladium (II)</b> Mol. Formula: $[Pd(acac)_2]$ Mol. Weight: 304	14024-61-4	Yellow orange solid/ powder	34.7 %
04	<b>Dibenzylidene-acetone</b> <i>Alternative Name:</i> <b>(dibenzylideneacetone)</b> 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	<b>Bis(dibenzylideneacetone)palladium (0)</b> <i>Alternative Name:</i> <b>palladium (0) bis(dibenzylideneacetone)</b> Mol. Formula: $(C_{17}H_{14}O)_2 Pd$	52409-22-0	Reddish brown powder	18.3%
06	<b>Tris(dibenzylideneacetone) dipalladium (0)</b> Synonym: <b><math>Pd_2(dba)_3</math></b> <i>Alternative Name:</i> <b>dipalladium-tris(dibenzylideneacetone)</b> Mol. Formula: $C_{51}H_{42}O_3Pd_2$ Mol. Weight: 915.72	51364-51-3	Purple powder	21.5 %
07	<b>Tris(dibenzylideneacetone) dipalladium (0) - Chloroform</b> <i>Alternative Name:</i> <b>dipalladium-tris(dibenzylideneacetone) chloroform complex</b> Mol. Formula: $C_{51}H_{42}O_3Pd_2 CHCl_3$ Mol. Weight: 1035	52522-40-4	Purple solid / powder	20.3 %
08	<b>Bis (triphenyl phosphine) dichloro palladium (II)</b> Mol. Formula: $[PdCl_2\{PPh_3\}_2]$ Mol. Weight: 701	13965-03-2	Yellow solid	15.0 %
09	<b>Tetrakis (Triphenyl Phosphine) Palladium (0)</b> 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	9.0 %
10	<b>[1,1- bis (diphenyl phosphino) ferrocene] dichloro palladium (II) dichloromethane adduct</b> 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 %
11	<b>[1,1-bis (diphenyl phosphino) ferrocene] dichloro palladium (II)</b> Mol. Formula: $[Pd\{dppf\}Cl_2]$ Mol. Weight: 731.71	72287-26-4	Brick red solid	14.2 %

12	<b>[1,1-bis (diphenyl phosphino) ferrocene] dichloro palladium (II) acetone adduct</b> Mol. Formula: $[\text{Pd}\{\text{dppf}\}\text{Cl}_2] \cdot \text{CH}_3\{\text{CO}\}_2$ $\text{Pd}\{\text{Ph}_2\text{PC}_5\text{H}_4\text{FeC}_5\text{H}_4\text{PPh}_2\}\text{Cl}_2 \cdot \text{CH}_3\{\text{CO}\}_2$ Mol. Weight: 789	851232-71-8	Brick red solid	13.2 %
13	<b>Dichloro bis (di tert. butyl phenyl phosphine) palladium (II)</b> Mol. Formula: $[\text{C}_6\text{H}_5\text{P}\{\text{C}(\text{CH}_3)_3\}_2]_2\text{PdCl}_2$ or $\text{C}_{28}\text{H}_{46}\text{P}_2\text{PdCl}_2$ Mol. Weight: 621.94	34409-44-4	Pale yellow to dark yellow powder	16.9 %
14	<b>1,4 - Bis( diphenylphosphino ) butane-palladium (II) chloride</b> Empirical Formula: $\text{C}_{28}\text{H}_{28}\text{Cl}_2\text{P}_2\text{Pd}$ Mol. Formula: $\text{PdCl}_2(\text{dppb})$ Mol. Weight: 603.80	29964-62-3	Light yellow solid/ crystals/ powder	17.0 %

**Grades of Raney Nickel Catalyst (Active) and their Typical Applications**

<b>Grade</b>	<b>Application</b>
<b>RNP</b>	<ul style="list-style-type: none"> <li>✓ Reduction of Cyano group to Amine</li> <li>✓ Olefinic Bond Reduction</li> <li>✓ Nitro to Amine Reduction</li> <li>✓ Reduction of dinitro derivatives of naphthalene compound to corresponding amine.</li> <li>✓ De-hydrogenation of Menthadienes.</li> <li>✓ Reduction of Oxime to Amine</li> <li>✓ Reduction of Carbonyl to Alcohol</li> <li>✓ O-Debenzylation</li> </ul>
<b>RNP-A</b>	<ul style="list-style-type: none"> <li>✓ Reduction of Nitro group to Amine</li> <li>✓ Reduction of Alkene to Alkane</li> <li>✓ Used for Venlafaxine Hydrochloride</li> <li>✓ Hydrogenation of a double bond conjugate to the ring (reduces only c=c bond)</li> </ul>
<b>RNP-F</b>	<ul style="list-style-type: none"> <li>✓ Reduction of Nitrile group to Primary Amine</li> <li>✓ Aliphatic Nitro &amp; Double Bond reduction</li> <li>✓ Reduction of Oxy Carbazole</li> <li>✓ Hydrogenation of Furan derivative to Tetra-hydro Furan derivative</li> <li>✓ Phenol to Cyclohexanol</li> <li>✓ Benzaldehyde to Benzyl Alcohol</li> <li>✓ Benzyl Alcohol to Cyclohexyl Methanol</li> <li>✓ Nitrophenol to Aminophenol</li> <li>✓ Aminophenol to Hydroxy Cyclohexyl Amine</li> <li>✓ O-Debenzylation, N- Debenzylation</li> </ul>
<b>RNK</b>	<ul style="list-style-type: none"> <li>✓ Dehydrogenation of aromatics, Can withstand higher temperature for a longer period.</li> </ul>
<b>RNK-F</b>	<ul style="list-style-type: none"> <li>✓ Dehydrogenation of cyclohexane derivative to produce benzene derivative.</li> <li>✓ Hydrogenation of Dextrose to Sorbitol</li> <li>✓ Reduction of Nitriles to Amines with higher recycles</li> <li>✓ Ammonolysis of alcohol (1,6 Hexanediol to hexamethylene diamine)</li> </ul>
<b>RNO-WOC</b>	<ul style="list-style-type: none"> <li>✓ Used during conversion of Nitrile to Aldehyde</li> </ul>
<b>RNP-WOC</b>	<ul style="list-style-type: none"> <li>✓ Hydrogenation of Nitro group to Amine</li> <li>✓ Reductive Amination of Aldehyde and Ketones to Primary Amine</li> </ul>
<b>RNP-D</b>	<ul style="list-style-type: none"> <li>✓ Desulphurization</li> </ul>

**Note: The applications are not exclusive for a particular grade. These are preferred applications.**

## Palladium on Carbon Catalysts & their Typical Applications

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

**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.