

Precious Metal Catalysts of Kawaken Fine Chemicals

【Palladium Charcoal】

Product name	Pd Content	Type	Characteristics	Recommended reaction
M	5%、10%	Uniform	The catalyst is general type of hydrogenation catalyst. It can be used for various hydrogenation.	Nitro, Olefin, Aldehyde, Dehalogenation
PH	5%、7.5%	Uniform	The catalyst is high metal dispersion type. The activity is excellent for many reactions. It is mainly used for debenzylation and hydrogenation of aromatic nucleus, olefin, and nitro group.	Debenzylolation, Aromatic nucleus, Nitro, Olefin
AD	5%	Uniform	The catalyst is good for filtration. It is a high alkali type and effective in hydrogenation of imine, and a reaction to cyclohexanone from phenol.	Imine, Aromatic nucleus, Olefin, Dehalogenation
	10%	Uniform	The catalyst is different from 5%AD. The catalyst is low alkali type. It is used for hydrogenation of aromatic nucleus.	Aromatic nucleus
MA	10%	Uniform	The catalyst is slightly acidic. It is suitable for reactions in acidic condition. The activity is excellent for hydrogenation of aromatic nucleus. It can be used for hydrogenolysis.	Aromatic nucleus, Hydrogenolysis
EA	5%	Egg shell	The catalyst is slightly acidic and egg shell type. The activity is excellent for hydrogenation of aromatic nucleus. It can be used for hydrogenolysis and dehalogenation.	Aromatic nucleus, Hydrogenolysis, Nitro, Olefin
EB	5%	Egg shell	The catalyst is alkaline and egg shell type. The activity is relatively excellent for many reactions. It is especially suited for debenzylation and hydrogenation of aldehyde. It is also used for the cross-coupling reaction.	Debenzylolation, Aldehyde, Nitro, Olefin
LA	5%	Egg shell	This is slightly acidic and egg shell catalyst which is improved version of EA type. Its activity is excellent for hydrogenation of Nitro group and Olefin at low temperature and low hydrogen pressure.	Nitro, Olefin, Debenzyloxycarbonylation
LB	5%	Egg shell	This is alkaline and egg shell catalyst which is improved version of EB type. Its activity is excellent for hydrogenation of Nitro group, Olefin and debenzylation at low temperature and low hydrogen pressure.	Nitro, Olefin, Debenzylolation
F	10%	Uniform	The catalyst is high purity type. It has extremely low content of Na, Ca, and Mg. It can be used for the reaction which needs high purity refinement.	Aromatic nucleus, olefin, hydrogenolysis

【Palladium hydroxide Charcoal】

Pd Content	Type	Characteristics	Recommended reaction
20%	Uniform	The catalyst is Pearlman's catalyst. It is especially suited for debenzylation at low temperature and low pressure.	Debenzylolation

【Bismuth modified Palladium Charcoal】

Product name	Pd Content	Characteristics	Recommended reaction
—	5%	This catalyst is Bismuth modified Palladium charcoal. It is used for selective partial hydrogenation of alkynes to alkenes instead of Lindlar's Catalyst (Lead modified 5%Pd/CaCO ₃). It is not poisoned with Lead. Thus it has less toxicity than Lindlar's Catalyst.	Selective partial hydrogenation (Alkynes → Alkenes)

【Platinum Charcoal】

Product name	Pt Content	Characteristics	Recommended reaction
—	2%, 5%, 10%	The catalyst is general type of Pt/C. It can be used for the various hydrogenation without debenzylation. It is especially used for the hydrogenation of olefin, nitro, aldehyde, ketone, imine, oxime and aromatics nucleus.	Olefin, Nitro, Aldehyde, Ketone, Imine, Oxime, Aromatics nucleus

【Sulfur modified Platinum Charcoal】

Product name	Pt Content	Characteristics	Recommended reaction
—	3%	This catalyst is Sulfur modified Platinum charcoal. It is used for chemoselective hydrogenation. It has excellent activity for selective hydrogenation of nitro groups and olefins in the presence of aromatic halides.	Selective hydrogenation (Non-dehalogenation)

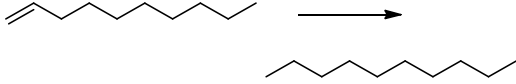
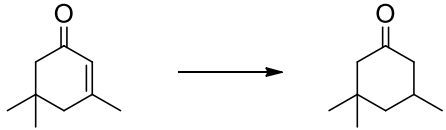
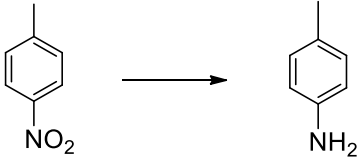
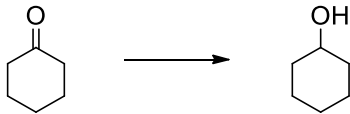
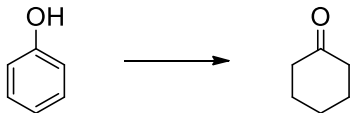
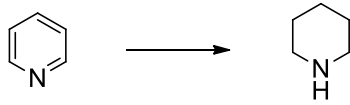
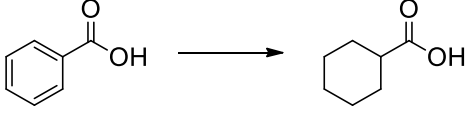
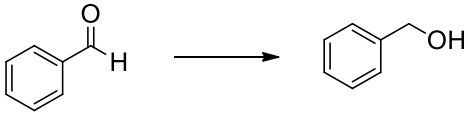
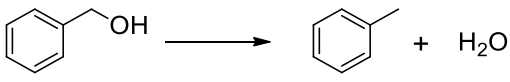
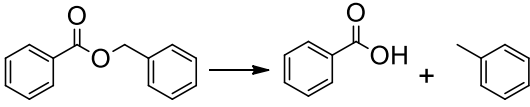
【Ruthenium Charcoal】

Product name	Ru Content	Characteristics	Recommended reaction
SD	5%	The catalyst is used for hydrogenation of aromatics nucleus, olefin, ketone and ester. It is especially used for the hydrogenation of aliphatic aldehyde and sugar group.	Aromatics nucleus, Carbonic acid, Ester

【Rhodium Charcoal】

Product name	Rh Content	Characteristics	Recommended reaction
K	5%	The catalyst is used for hydrogenation of nitro, oxime and olefin. And it is also used for the hydrogenation of aromatics nucleus of heterocyclic compounds such as pyridine.	Nitro, Oxime, Olefin, Aromatics nucleus (Heterocyclic compounds)
N	5%	This is slightly acidic Rhodium charcoal catalyst. It is especially used for the hydrogenation of aromatics nucleus of aromatic hydrocarbons such as benzene.	Nitro, Oxime, Olefin, Aromatics nucleus (Aromatic hydrocarbons)

Performance list of Palladium Charcoal

Reaction Site (Reactant)		M	PH	AD	MA	EA	EB	F
Double bond (1-Decene)		⊙	⊙	⊙ 5%	⊙	⊙	⊙	—
Double bond (Isophorone)		○	○	○ 10%	⊙	⊙	○	⊙
Nitro (p-Nitrotoluene)		○	○	—	—	⊙	⊙	—
Ketone (Cyclohexanone)		—	—	—	○	○	—	⊙
Aromatic nucleus (Phenol)		○	⊙	⊙ 5%	—	—	⊙	—
Aromatic nucleus (Pyridine)		—	—	⊙ 10%	⊙	⊙	⊙	⊙
Aromatic nucleus (Benzoic acid)		○	○	—	○	⊙	—	⊙
Aldehyde (Benzaldehyde)		○	—	—	—	—	⊙	—
Alcohol (Benzyl alcohol)		—	—	—	○	⊙	—	○
Debenzylation (Benzyl benzoate)		○	⊙	—	—	—	⊙	—