

Catalysts

Catalytic compounds are essential to many industrial and scientific chemical processes applied to metals. These catalytic compounds are based on precious metals, such as silver, palladium, platinum, and others.

SAFINA's portfolio of chemical catalysts is based on a variety of different precious metals, with the two most important being palladium or platinum immobilized on active carbonium. The main use of these two catalysts (and their chemical derivatives) is in various applications of hydrogenation processes.

While these catalysts are employed in many fields and industries globally, the most common use for these precious metal catalysts is in the field of organic chemistry.

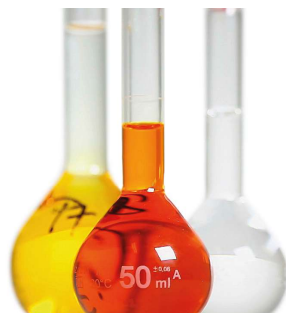
SAFINA, a. s. is able to provide customers with specific modifications to existing catalysts, or even to develop new types of catalysts for different types of use. SAFINA, a. s. can offer customers comprehensive service – from the development of new types of catalysts, to production of the catalysts, and on to recycling the spent and used catalysts.

Chemicals

The chemical compounds offered by SAFINA, a. s. are produced primarily for the chemical and pharmaceutical industries, for galvanization processes, and for analytic and research laboratories.

The compounds produced by SAFINA are of the highest standards of purity, indicated as "pure" or "for analysis", and in compliance with the relevant standards.

SAFINA, a. s. is the established leader in the field of precious metals processing and recycling in Central and Eastern Europe, and is a well qualified supplier of precious metals products for clients around the globe.



Market Expansion
Services by
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Refining Catalyst Chemicals



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Refining

Mission

SAFINA's core objective is to offer customers a professional, tailor-made service (the characteristics of the material determine the choice of treatment after homogenization) with state of the art evaluation methods, equipment, professional attitude and maximum transparency.



Our Refining Department maintains strict controls and acknowledges the integrity of all refining jobs, regardless of size or whether sourced from high or low-grade material.

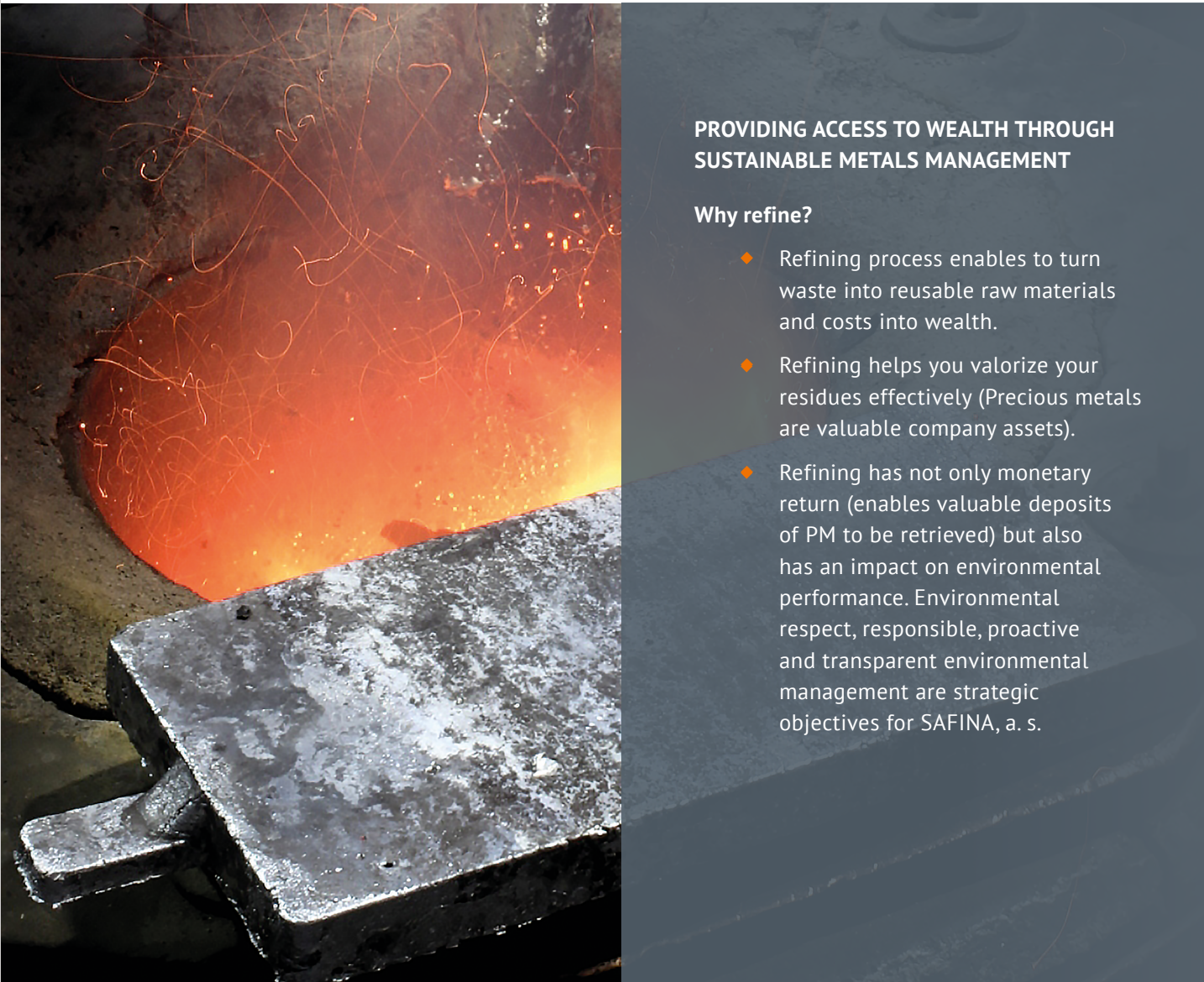
We refine precious metals in following sectors

♦ Industrial catalysts – refinery & petrochemical industry (catalytic reforming, isomerization and hydrocracking)	→ Refined metals – Pt, Pd, Rh, Ag
♦ Chemical applications (labware, solutions)	→ Refined metals – Pt, Pd, Rh, Au, Ag
♦ Glass & fibre industry (waste from polishing, waste from glass deciration, furnace cleanings, fireclay, thermocouples, mirroring residues)	→ Refined metals – Pt, Pd, Ir, Rh, Ag, Au
♦ Medical and Dental equipment (dental gold, amalgams, Laboratory components and samples, Dental processing residues)	→ Refined metals – Au, Ag, Pt, Pd, Rh
♦ Jewelry (Coins & Mints , Watch cases, Jewelry manufacturing scrap – chains, rings, rods, Gold-plated items, Silver-plated items)	→ Refined metals – Au, Ag, Pt, Pd, Rh, Ir
♦ E-scrap (PC components, Electronic components, Gold-plated cables, electronic devices, mobiles, contact materials)	→ Refined metals – Au, Ag, Pt, Pd
♦ Electronics & sensor technology (sensors, ceramic components)	→ Refined metals – Au, Ag, Pt, Pd
♦ Converters (end of life Catalytic converters, spent automotive catalysts)	→ Refined metals – Pt, Pd, Rh
♦ Destructive and Non-destructive cleaning of Nitric ACID plants (destructive/nondestructive PGM recovery)	→ Refined metals – Pt, Pd, Rh
♦ Other PGM residues and sweeps containing precious metals which are mixed with organic waste (scrap metal from casting, filter dust, sludge, slag, ashes, crucible materials, filtrates, floor sweepings, cakes, old stock)	→ Refined metals – Au, Ag, Pt, Pd, Rh, Ir, Ru

Precious Metals Life Cycle

Waste collection	SAFINA, a. s. has the capability to process a variety of complex and diverse feedstock materials into our refinery.
Preliminary treatment	Usually consists of drying, grinding and milling.
Homogenization	The choice of the homogenization technique depends on the characteristics of the materials.
Sampling	Essential for the accurate quantification of the real content of precious metals in the waste.
Analysis	We assay obtained samples to the highest level of accuracy, evaluating a deposit of Precious metals.
Settlement	
Refining	Turning refined Precious metals into innovative value-added products.

ALL STEPS ARE IN COMPLIANCE WITH ALL LEGAL, ENVIRONMENTAL AND SAFETY REGULATION.



PROVIDING ACCESS TO WEALTH THROUGH SUSTAINABLE METALS MANAGEMENT

Why refine?

- ♦ Refining process enables to turn waste into reusable raw materials and costs into wealth.
- ♦ Refining helps you valorize your residues effectively (Precious metals are valuable company assets).
- ♦ Refining has not only monetary return (enables valuable deposits of PM to be retrieved) but also has an impact on environmental performance. Environmental respect, responsible, proactive and transparent environmental management are strategic objectives for SAFINA, a. s.

Ag catalysts	Pd catalysts	Pt catalysts
Silver oxide – Ag ₂ O	Palladium on active carbonium – Pd/C – 3%, 5%, 10%	Platinum on active carbonium – Pt/C – 1%, 3%, 5%, 10%

Ag	
Silver nitrate	AgNO ₃
Mining & Metal industry	
Glass industry	
Chemical industry	
Electronics &Electrical Engineering	
Jewelry & Financial Investment	
Pharmaceutical industry & Medical devices	

Potassium silver cyanide	K[Ag(CN) ₂]
Mining & Metal industry	
Chemical industry	
Electronics &Electrical Engineering	
Jewelry & Financial Investment	
Pharmaceutical industry & Medical devices	

Silver cyanide	AgCN
Mining & Metal industry	
Chemical industry	
Electronics &Electrical Engineering	
Jewelry & Financial Investment	
Pharmaceutical industry & Medical devices	

Silver chloride	AgCl
Mining & Metal industry	
Glass industry	
Chemical industry	
Electronics &Electrical Engineering	
Jewelry & Financial Investment	
Pharmaceutical industry & Medical devices	

Silver sulphate	Ag ₂ SO ₄
Mining & Metal industry	
Glass industry	
Chemical industry	
Electronics &Electrical Engineering	
Jewelry & Financial Investment	
Pharmaceutical industry & Medical devices	

Au	
Gold chloride	AuCl ₃ xH ₂ O
Mining & Metal industry	
Chemical industry	
Electronics &Electrical Engineering	
Jewelry & Financial Investment	
Pharmaceutical industry & Medical devices	

Potassium cyano aurate	K[Au(CN) ₂]
Mining & Metal industry	
Chemical industry	
Electronics &Electrical Engineering	
Jewelry & Financial Investment	
Pharmaceutical industry & Medical devices	

Gold chloride	AuCl ₃ xH ₂ O
Mining & Metal industry	
Chemical industry	
Electronics &Electrical Engineering	
Jewelry & Financial Investment	
Pharmaceutical industry & Medical devices	

Tetrachloroauric acid	HAuCl ₄
Mining & Metal industry	
Chemical industry	
Electronics &Electrical Engineering	
Jewelry & Financial Investment	
Pharmaceutical industry & Medical devices	

Pt & Pd & Rh	
Palladium nitrate	Pd(NO ₃) ₂
Mining & Metal industry	
Chemical industry	
Automotive component industry	
Electronics &Electrical Engineering	

Potassium hexachloroplatinate	K ₂ PtCl ₆
Mining & Metal industry	
Chemical industry	
Electronics &Electrical Engineering	

Rhodium chloride	RhCl ₃
Mining & Metal industry	
Chemical industry	
Automotive component industry	
Electronics &Electrical Engineering	
Jewelry & Financial Investment	

Rhodium nitrate	Rh(NO ₃) ₃
Mining & Metal industry	
Chemical industry	
Automotive component industry	
Electronics &Electrical Engineering	

Palladium chloride	PdCl ₂
Mining & Metal industry	
Glass industry	
Chemical industry	
Automotive component industry	
Electronics &Electrical Engineering	
Jewelry & Financial Investment	
Pharmaceutical industry & Medical devices	

Hexachloroplatinic acid – solution hydrate	H ₂ PtCl ₆
Mining & Metal industry	
Glass industry	
Chemical industry	
Automotive component industry	
Electronics &Electrical Engineering	
Jewelry & Financial Investment	
Pharmaceutical industry & Medical devices	