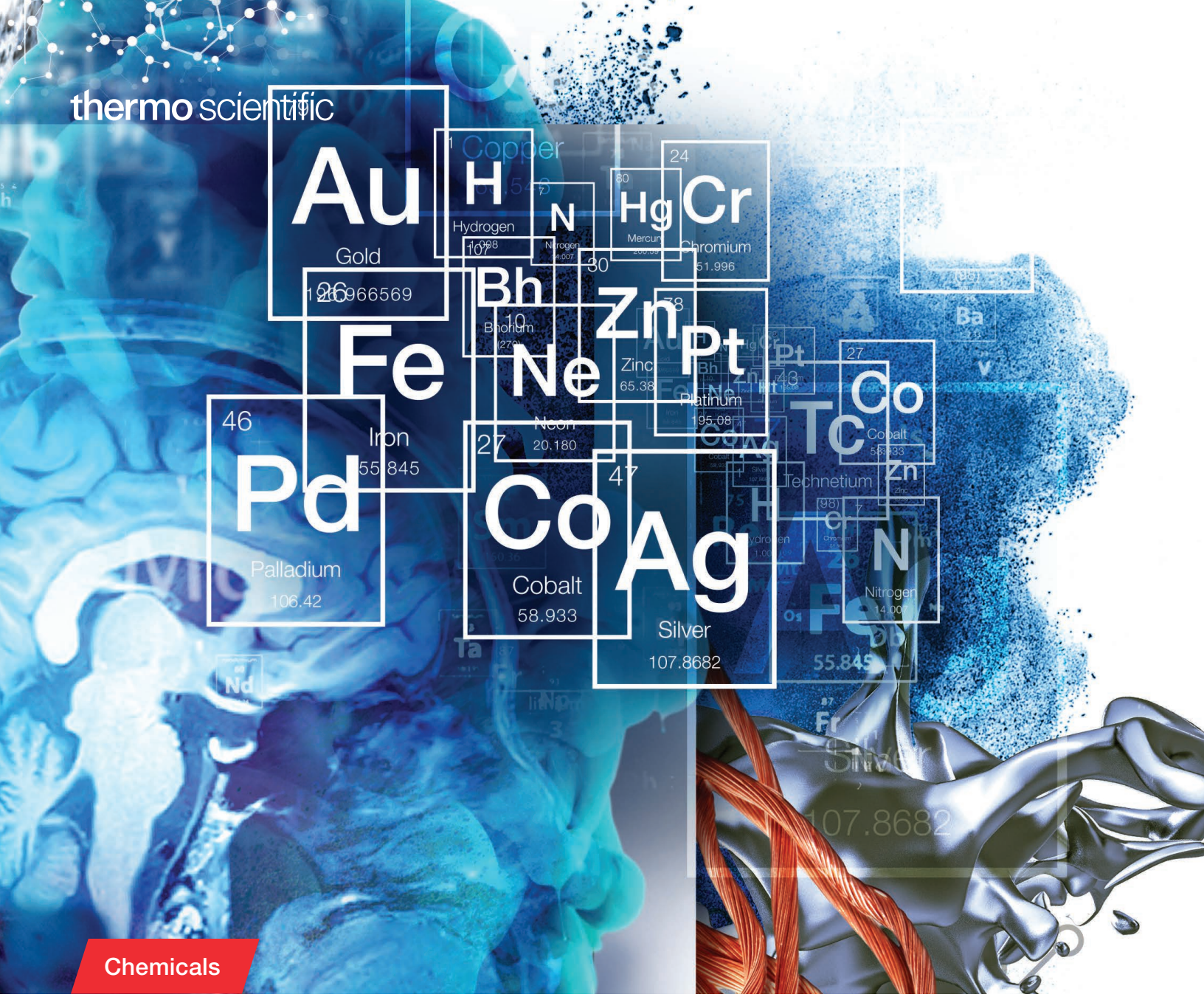


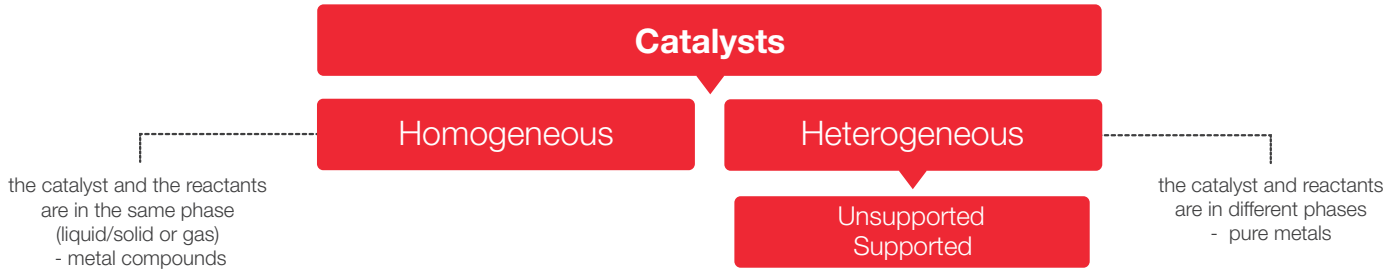

# Thermo Scientific Catalysts

## Varying purities and concentrations

Find it at **fishersci.com** and **fishersci.ca**

fisher scientific
part of Thermo Fisher Scientific

# Thermo Scientific Catalysts




## Metal catalysts

Metal catalysts are extensively being used in both research laboratory and industrial/manufacturing scale chemistry. Indeed, it will be exceptional, if you find any complex organic synthesis or industrial manufacturing process that does not, at some stage, utilize a metal catalyst. In other words, most of the commercially produced chemicals utilize metal catalysts at some stage in the process of their manufacturing processes.

Transition metals are an exceptional choice for catalyst in modern organic, organometallic and electro chemistries. They have the capability to be in a variety of oxidation states, interchange between states, form complexes with organic ligands and are a good source of electrons.

## Precious metal catalysts

Catalytic processes in organic synthesis require “late transition metals” such as palladium, platinum, gold, ruthenium, rhodium, or iridium. Cross-coupling reactions, which have been widely used for several organic transformations, will be difficult to perform by a classical pathway without using metal catalysts such as palladium, platinum copper, nickel, ruthenium, and rhodium. Due to their high selectivity, precious metal chemicals are often the first choice as heterogeneous catalysts for a wide variety of research and industrial chemical applications.

The Thermo Scientific metal catalysts portfolio includes a range of homogeneous, heterogeneous, supported/unsupported, and electro catalysts. The catalysts are offered in a wide selection of purities and concentrations for a broad range of organic synthesis routes for the pharmaceutical industry. We offer a unique collection of chiral ligands for asymmetric hydrogenation, novel palladium coupling catalysts, platinum group metal (PGM)-based heterogeneous catalysts as well as sponge nickel catalysts.

**Our metal catalysts can provide shorter synthetic routes, efficient manufacturing processes, cost effective production and a safer environment.**

## Application highlights

### Organic synthesis

Pure metals and metal compounds offer unique opportunities for an organic chemist due to their versatile properties and pronounced catalytic activities. Metal catalysts are extensively used in organic synthesis. Both homogeneous and heterogeneous catalysts are used in organic research laboratory. Homogeneous catalysis are excellent choice where highly specific reactions are desired including chiral transformations. Pt catalyzed hydrogenation of an unsaturated organic compound is an example for heterogeneous catalysis.

### Bioactive synthesis

Transition metal mediated cross-coupling reactions received great attention in recent years towards the synthesis of various biologically active molecules, natural products, nucleosides, nucleotides, and oligonucleotides. Palladium-catalyzed coupling reactions have been implicated in constructing carbon-carbon and carbon-hetero atom bonds. Such metal catalyzed reactions offer synthetic versality and efficiency to wide range of bioactive molecules.

### Pharma industry

Increasing focus has been on the environmental impact of manufacturing processes in pharmaceutical industry where there is a large amount of drug products manufactured globally. Various metal catalysts have been extensively used in pharma industry to enhance the sustainability of pharmaceutical products, leading to the shorter and very efficient synthetic routes. By facilitating selectivity, high yield, economic and environmental friendly processes, metal catalysts offer great profitable options for drug manufacturers.

### Petroleum refinery

Catalytic processes are very important in modern refineries and petrochemical industry. The leader in the petroleum industry is often dictated by the proper use of efficient catalysts. In petroleum refining, most of the processes beyond the crude unit is catalytic in nature. Metal catalysts plays a critical role in reducing the aromatic content and increasing fuel octane numbers through various organic transformations like hydrogenation, alkylation, isomerization. Heterogeneous catalysts have been widely used in many petroleum refining processes, such as fluid catalytic cracking (FCC), hydrocracking, and hydrotreating.

### Fuel cells

Redox reactions are important component of fuel cells in converting chemical energy into electricity. Electro catalysts enhance the rates of the half reactions (oxidation or reduction component of redox reaction) that comprise the fuel cell. Redox characteristics of the electro catalysts offer a great advantage for their use in fuel cells. Electro catalysts offer enhanced performance and durability of fuel cells. The next generation electro catalysts are now available with corrosion resistant carbon supports for automotive fuel cell applications.

### Cleaner environment

Catalysts play a very important role in protecting the environment. Catalysts play a major role in treating exhaust gases from motor vehicles, manufacturing facilities and power plants. The result is a cleaner environment. Catalysts are an essential component in emission control devices. Metal catalysts help convert over 90% of harmful elements like hydrocarbons, carbon monoxide, and oxides of nitrogen from gasoline engines into less harmful carbon dioxide, nitrogen and water vapor.

# Thermo Scientific Catalysts

## Homogeneous catalysts

| Fisher Scientific Cat. No. | Description | Size |
|---|---|---|
| AA11046 | Ammonium tetrachloroplatinate(II), 99.9% (metals basis), Pt 51% min | 1 g, 5 g |
| AA11046 | Dihydrogen hexachloroiridate(IV) hydrate, 99% (metals basis), Ir 38-42% | 5 g, 25 g, 100 g, 500 g |
| AA11051 | Dihydrogen hexachloroplatinate(IV) hydrate, 99.9% (metals basis) | 5 g, 50 g, 100 g, 250 g |
| AA39741 | Gold(I) sodium thiosulfate hydrate, 99.9% (metals basis) | 1 g, 5 g, 25 g, 50 g |
| AA39742 | Gold(III) acetate, 99.9% (metals basis) | 0.5 g 1 g, 5 g |
| AA12163 | Gold(III) chloride, Au 64.4% min | 0.25 g, 1 g, 5 g, 10 g |
| AA36400 | Hydrogen tetrachloroaurate(III) trihydrate, ACS, 99.99% (metals basis), Au 49.0% min | 1 g, 10 g, 25 g, 50 g |
| AA11030 | Iridium(III) chloride hydrate, 99.8% (metals basis) | 5 g, 10 g, 50 g, 100 g, |
| AAA17849 | Iridium(IV) oxide powder, 99% | 1 g, 5 g |
| AA12103 | Osmium(VIII) oxide, 99.8% (metals basis), Os 74.4% min | 5 g, 10 g, 50 g, 100 g |
| AA10516 | Palladium(II) acetate, Pd 45.9-48.4% | 10 g, 100 g, 250 g, 500 g |
| AA11034 | Palladium(II) chloride, 99.9% (metals basis), Pd 59.0% min | 10 g, 100 g, 250 g, 500 g |
| AA11035 | Palladium(II) nitrate hydrate, 99.8% (metals basis), Pd 39% min | 2 g,10 g, 25 g, 50 g |
| AA10526 | Platinum(II) 2,4-pentanedionate, Pt 48.0% min | 5 g, 25 g, 50 g, 100 g |
| AA11048 | Potassium tetrachloroplatinate(II), 99.9% (metals basis), Pt 46.0% min | 5 g, 25 g, 100 g, 500 g |
| AA11814 | Rhodium(III) oxide, anhydrous, 99.9% (metals basis), Rh 80.6% min | 1 g, 2 g, 5 g, 10 g |
| AA12175 | Ruthenium(III) nitrosylnitrate, Ru 31.3% min | 1 g, 5 g, 10 g, 25 g |
| AAA10816 | Ruthenium(IV) oxide, anhydrous, 99.9% | 1 g, 5 g, 10 g, 25 g |
| AA10548 | Tetrakis(triphenylphosphine)palladium(0), 99.8% (metals basis), Pd 9% min | 10 g, 50 g, 100 g, 250 g |
| AA12760 | Tris(dibenzylideneacetone)dipalladium(0), Pd 21.5% min | 10 g, 50 g, 100 g, 250 g |

## Heterogeneous catalysts

| Fisher Scientific Cat. No. | Description | Size |
|---|---|---|
| AA38330 | Iridium, 1% on activated carbon powder, reduced, nominally 50% water wet | 5 g, 25 g, 100 g |
| AA31276 | Nickel on silica-alumina, catalyst | 5 g, 25 g, 100 g, 500 g |
| AA89114 | Palladium, 0.5% on 3.18mm (0.125in) alumina pellets, unreduced | 25 g, 100 g, 250 g, 500 g |
| AA44696 | Palladium, 10% on activated carbon powder, eggshell, reduced | 50 g |
| AA44350 | Palladium, 10% on activated carbon powder, Type 58, standard, reduced, nominally 50% water wet | 5 g, 25 g, 100 g |
| AAA12012 | Palladium, 10% on carbon, Type 487, dry | 5 g, 25 g, 100 g, 500 g |
| AA11713 | Palladium, 5% on γ alumina powder, reduced | 5 g, 25 g, 100 g, 500 g |
| AA41825 | Palladium, 5% on 3mm alumina pellets | 5 g, 25 g, 100 g |
| AA44142 | Palladium, 5% on activated carbon powder, standard, reduced, acidic catalyst, nominally 50% water wet | 10 g, 50 g, 250 g |
| AA21162 | Palladium, 5% on barium sulfate powder, unreduced | 10 g, 50 g |
| AA11723 | Palladium, 5% on calcium carbonate powder, reduced | 5 g, 25 g, 100 g, 500 g |
| AA89106 | Platinum, 0.5% on 2.7-3.3mm (0.11-0.13in) alumina pellets, reduced | 10 g, 50 g, 100 g, 500 g |
| AA38343 | Platinum, 1% on granular carbon, reduced, nominally 50% water wet | 25 g, 100 g |
| AA44222 | Platinum, 5% on alumina powder, reduced | 5 g, 25 g, 100 g |
| AA44863 | Rhodium, 5% on activated carbon paste, C101023-5 | 2 g, 10 g |
| AAH36201 | Rhodium, 5% on alumina powder, C301099-5 | 5 g, 25 g, 100 g |
| AA11770 | Rhodium, 5% on alumina powder, reduced | 2 g, 10 g |
| AA44575 | Ruthenium, 2% on 3.18mm (0.125in) alumina pellets | 25 g, 100 g, 500 g |
| AA11749 | Ruthenium, 5% on alumina powder | 5 g, 25 g, 100 g |

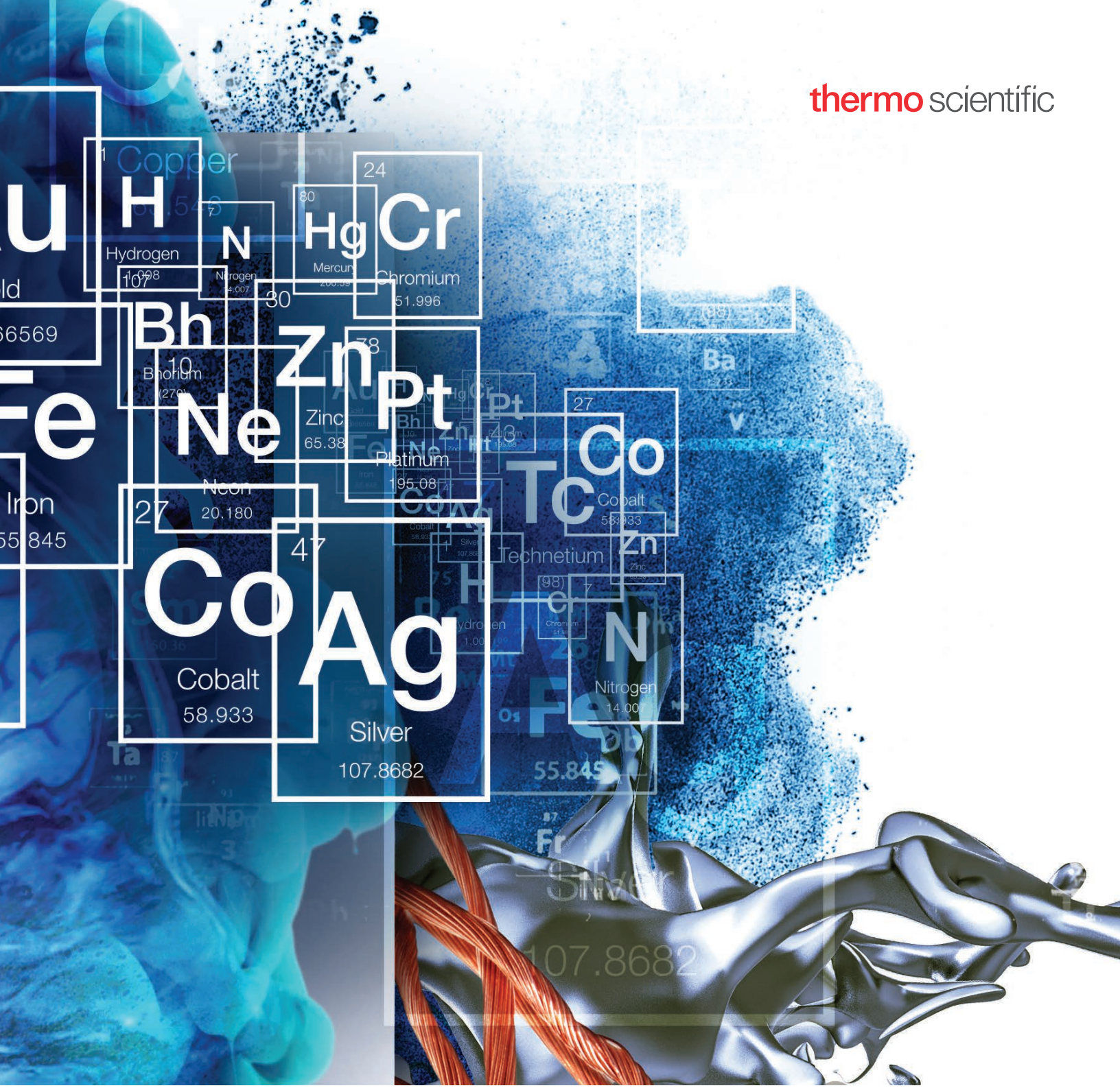


Full product listing is available online.

## Electro catalysts

| Fisher Scientific Cat. No. | Description | Size |
|---|---|---|
| AA47491 | Iridium(IV) oxide 50% | 1 g, 5 g |
| AA47400 | Platinum 50% - iridium(IV) oxide 50% | 1 g, 5 g |
| AA47380 | Platinum 75% - iridium(IV) oxide 25% | 1 g, 5 g |
| AA47357 | Platinum, nominally 10% on carbon black | 1 g, 5 g |
| AA47311 | Platinum, nominally 13.5%, cobalt, nominally 1.5% on durable carbon support | 1 g, 5 g |
| AA47337 | Platinum, nominally 15% on durable carbon support | 1 g, 5 g |
| AA47332 | Platinum, nominally 18%, cobalt, nominally 1%, chromium, nominally 1% on durable carbon support | 1 g, 5 g |
| AA47362 | Platinum, nominally 18%, cobalt, nominally 1%, nickel, nominally 1% on durable carbon support | 1 g, 5 g |
| AA47341 | Platinum, nominally 20% on durable carbon support | 1 g, 5 g |
| AA47312 | Platinum, nominally 20%, Ruthenium, nominally 10% on Vulcan XC72 Carbon | 1 g, 5 g |
| AA47301 | Platinum, nominally 27%, cobalt, nominally 1.5%, chromium, nominally 1.5% on Vulcan XC72 Carbon | 1 g, 5 g |
| AA47366 | Platinum, nominally 27%, cobalt, nominally 1.5%, nickel, nominally 1.5% on Vulcan XC72 Carbon | 1 g, 5 g |
| AA47346 | Platinum, nominally 27%, cobalt, nominally 3% on durable carbon support | 1 g, 5 g |
| AA47395 | Platinum, nominally 27%, cobalt, nominally 3% on Vulcan XC72 Carbon | 1 g, 5 g |
| AA47388 | Platinum, nominally 40% on durable carbon support | 1 g, 5 g |
| AA47379 | Platinum, nominally 40%, Ruthenium, nominally 20% on carbon black | 1 g, 5 g |
| AA47371 | Platinum, nominally 50%, Ruthenium nominally 25% on high surface area advanced carbon support | 1 g, 5 g |
| AA47334 | Platinum, nominally 60% on high surface area advanced carbon support | 1 g, 5 g |
| AA47310 | Platinum, nominally 70% on high surface area advanced carbonsupport | 1 g, 5 g |
| AA47399 | Platinum-ruthenium black, 67:33 | 1 g, 5 g |

Full product listing is available online.




Order our products online, visit: **fishersci.com** and **fishersci.ca**

Distributed by Fisher Scientific. Contact us today:

**In the United States**
Order online: fishersci.com
Fax an order: 1-800-926-1166
Call customer service: 1-800-766-7000

**In Canada**
Order online: fishersci.ca
Fax an order: 1-800-463-2996
Call customer service: 1-800-234-7437

fisher scientific
part of **Thermo Fisher Scientific**



12/21 BN040317CH75