

HISTORY OF PODIUM METALS

The concept of awarding podium medals to athletes' dates to the Greek and Roman Olympics, when the victors were given wreaths of olive, laurel, and pine as a sign of success. The 1904 Olympics in USA were the first Olympic competition that had gold, silver and bronze as podium medals.

In the periodic table gold, silver and copper exist on the same column. Thus, having similar physical properties. They are all long-lasting, easily mouldable and have good electrical conductivity. What it comes to rarity, copper is the most frequently found metal, silver being slightly less common and gold being the rarest. Thus, they also in this way compliment the symbolics involved in podium prizing.

Bronze (CuSn)

Melting point: ~910 °C
Boiling point: ~2300 °C
Density: 8,7 g/cm³
Atomic number: Alloy (Copper 27 & Tin 50)

Bronze is an alloy consisting primarily of copper (Cu) and Tin (Sn). There are several bronze mixtures, but a typical composition contains 88% of copper and 12% of tin. Also, other elements like aluminium, manganese, nickel, zinc, phosphorus, arsenic or silicon are often added to the alloy.

Bronze has and still is used for example in coins, weapons, sculptures and musical instruments. Due to its toughness and resistance to saltwater corrosion it is commonly utilized in ship propellers, submerged bearings, electrical connectors, clips and springs.

Like all metals, bronze can be recycled infinitely. The only limitation is whether it ends up to a recycler or not.

Overall, recycling bronze is an important environmental and economic practice that can help reduce energy consumption, minimize waste and reduce the need for mining and production.

Did you know that Bronze age (~3300 BC to ~1200 BC) got its name, from the fact that during this time period bronze was the hardest metal in widespread use.

Silver (Ag)

Melting point: 961,78 °C
Boiling point: 2162 °C
Density: 10,49 g/cm³
Atomic number: 47

Silver (chemical symbol 'Ag', derived from the Latin word *argentum*) is a soft, white, lustrous transition metal, it has the highest electrical conductivity of any element and the highest thermal conductivity of any metal. Silver is found in nature in its purest form, as an alloy with gold and other metals, and in minerals such as argentite and chlorargyrite.

Most part of silver as virgin material is created as a secondary by-product of electrolytic refining of copper, lead, zinc and gold. Also in recycling, silver is mainly extracted via electrolysis when precious metals are being separated from copper raffinate.

Silver is widely used in electronic equipment. This is due to its extreme ductility and conductivity. It is also used in jewelry, photography, coins, medical instruments and as a catalyst in the manufacturing of pharmaceuticals and chemicals.

Silver is a very energy-intensive material to produce. By recycling, we can reduce the amount of energy needed to produce new silver and the associated environmental impacts. Therefore, electronics recycling is an important part in maintaining our circular economy and limiting the environmentally stressful processing steps related to virgin materials.

Gold (Au)

Melting point: 1064,18 °C
Boiling point: 2970 °C
Density: 19,3 g/cm³
Atomic number: 79

Gold (chemical symbol 'Au', derived from the Latin word *aurum*) is a bright yellow, dense, soft malleable and ductile metal and part of the precious metals group. It is resistant to most acids, but it dissolves in alkaline solutions of cyanide, that is used for instance in electroplating and is an important step also in secondary gold production.

Due to its relative rarity, gold has been used in jewellery, coinage and arts. In addition, it is used in dentistry, medicine, and aerospace.

Since gold is an excellent conductor of electricity, highly resistant to corrosion and has high ductility it is often used in electronics to make gold-plated connectors and contacts, that are found for instance from computers and cell phones.

Recycling gold means that less new gold needs to be mined. Hence, decreasing the negative impacts of mining such as reducing the amount of mercury or other toxins released into the atmosphere during the mining process. By recycling gold, it can be re-used and kept out of the waste stream. This helps to reduce the amount of pollution generated by landfills.