

Silver and gold

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Precious metals radiate eternity. Who would not like to immortalise themselves with gold and silver? Even the ancient cultures used the metals not only as jewellery, but also as burial objects. We can still admire much of this today in museums.

A typical feature of precious metals, which in addition to gold and silver also include palladium and platinum, is that they are usually found in pure form. In nature, pure metals are found without being bound to other elements such as oxygen as an oxide. An exception is silver, which often occurs as sulphide (compound with sulphur) or oxide in combination with ores of other metals such as lead, zinc and copper and is extracted from them.

Gold is a comparatively soft metal. It is therefore easy to form cold and hot – up to extremely thin gold leaf up to one ten-thousandth of a millimetre thick. In this form, it is used, for example, to coat wooden picture frames. Flakes of gold leaf also float in Gdansk Goldwasser, which is a liqueur enriched with distillates of essential oils from spices and citrus fruit peel. In this context, the general use of gold as a food colouring (E 175) should be mentioned. Fields of application are decorative chocolates and sweets. Since the metal is inert and is excreted unchanged, there are no concerns about its compatibility – a reason for cosmetics to also deal with this noble raw material in finely dispersed form and to incorporate it into various preparations. In decorative cosmetics, a golden shine can be achieved on the skin.

Gold as an active ingredient

But gold is also praised as an active ingredient – with correspondingly astronomical prices for the products, some of which are natural cosmetics. With reference to corresponding expert opinions, many effects are advertised. Small amounts of nanodisperse or colloidal gold form a stable mixture ("gold water") in water. From this it is concluded that gold is an excellent moisturiser and can bind an infinite amount of water in the skin in relation to its weight. Of course, this does not correspond to reality.

Likewise, antibacterial, antioxidant, anti-inflammatory, firming, smoothing, nourishing and anti-aging effects as well as freshness kicks – including the firming of collagen and the increase in its dermal production – are often referred to. Mood-lifting and stimulation of vital energy are other properties that belong in the realm of esotericism and placebos. Not to forget the mask

for gold lifting and the bath additive together with salts from the Dead Sea. Those who believe in it will benefit from it. This applies to manufacturers and users alike.

In homeopathy, gold dispersions are used in correspondingly high dilutions - among other things, against depression, sleep disorders and heart disease. For a long time, gold compounds such as auranofin alias (2,3,4,6-tetra-O-acetyl-1-thio-β-D-glucopyranosato)(triethylphosphane)gold orally as a tablet and sodium aurothiomalate injected intramuscularly were considered basic medical therapeutics for the treatment of chronic polyarthritis. They are now only very rarely prescribed because of their extremely high side effect rates.

Silver

Pure silver has gone out of fashion when it comes to commodities. Whereas owners used to show what they could afford with cutlery, drinking cups and vases, today people shy away from having to constantly clean their silverware. This is because it tends to turn black, especially when silver spoons are used to eat eggs or food prepared from them. The sensitivity stems from the fact that the otherwise noble metal likes to react with sulphur and sulphurous matter. And sulphur is always in the air, so to speak – be it from industrial gases, bodily flatulence or the typical sea smell attributable to dimethyl sulphide. The alloys, mostly made with copper, are much harder than pure silver, but still sensitive and not very suitable for the dishwasher. There, the beautiful shine is sometimes marred by small but stubborn whitish deposits. As an amalgam tooth filling – in combination with mercury – silver is at most still found in the remaining teeth of older contemporaries. Contrary to the fears of the time, it is now known that the mercury load of the alloy, which incidentally also occurs as a mineral in nature, is lower than initially assumed. Both mercury and silver have a strong antimicrobial effect that prevents caries and the like.

Germ inhibiting activity

The germ inhibiting activity of silver is due to its reaction with sulphur-containing peptides of microorganisms. This reaction resembles a common thread that extends from the use of micro-fine silver ("microsilver" or "nanosilver") in anti-septic wound plasters or as a preservative in pharmaceutical and cosmetic preparations to drinking water sterilisation using silver filters. The effect can be achieved with comparatively small amounts, preferably nanodisperse silver. The disadvantage of the dark colouring of white cosmetic creams was tried to be circumvented at times by working with colourless silver chloride powder, which is also used in tablets for water disinfection, among other things. The effect is the same. However, silver and silver compounds in cosmetics limit the use of other active ingredients because they have to be absolutely free of sulphur - a condition that is difficult to meet with extracts, vitamins, peptides and antioxidants.

Skin discolouration

In addition, another disadvantage turned out to be the prolonged use of silver and its compounds, especially in chronic skin problems such as neurodermatitis as well as inflammation and wound healing. A greying of the skin occurs, which becomes more pronounced the more intensively the metal penetrates the skin with other product components and precipitates there. The dark discolouration on the skin and mucous membranes is medically referred to as argyria (over a large area) or as argyrosis if it occurs locally. The discolouration cannot be removed and is therefore very long-lasting. For this reason, silver compounds have not become established for the preservation of operational technical fluids such as cooling lubricants.

In medicines and foodstuffs

The water-soluble silver nitrate known in medicine as lunar caustic has a corrosive and disinfectant effect. It is applied as a stick or in aqueous solution to open wounds, e.g., after the removal of warts. Its use has also declined considerably.

Despite the disadvantages mentioned, elemental silver is still approved as food colouring E 174, e.g., for colouring chocolates and confectionery, and is found in food supplements as a supposedly health-promoting component. Homeopathy uses silver and silver nitrate, for example, for headaches and heart complaints.

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