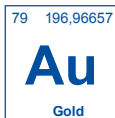


METAKEM
Precious metals & anodes

Gold-SF-Bath

High-quality cyanide-free gold electrolyte for
technical and decorative applications





Precious metal baths

Gold-SF-Bath**Technical data**

Au content:	10 - 15 g / L (range: 0 - 20 g / L)
pH:	7.5 (range: 7.2 - 8.0)
Temperature:	60°C (range: 55 - 65°C)
Anode:	Pt / Ti
Current density:	1 A / dm ² (range: 0.1 - 2 A / dm ²)
Voltage:	0.6 V (range: 0.5 - 0.8 V)
Yield, cathodic:	122 mg / Amin (approx. 0.6 µm / min at 1 A / dm ²)
Movement:	mech. agitation >5 m / min or corresponding fabric movement

Bath approach:

The sulphitic **Gold-SF-Bath** is supplied ready for use and must **under no circumstances** be diluted.

**Request product:**→ metakem.de/en/request**Equipment****Container:** Glass or plastic container (PP, PVDF)**Bath heater:** Glass- or PTFE-coated

Stirring: Powerful circulation, agitator or linear fabric movement. As stirrers can generate stationary vortices and thus stirring shadows, a pendulum linear movement may be more favourable at higher current densities (>0.5 A / dm²) (especially for large flat parts in round bath tanks).

Properties of the Gold Layer**Gold:** Au 99.9 %**Density:** 9.3 g / cm³**PH Value Adjustment**

If the bath is operated open, some ammonia evaporates during the coating process. The pH must then be checked and, if necessary, corrected with ammonia solution 25 %. The pH can be adjusted to 7.5 in the cold bath; if too much ammonia is added, the pH can be corrected with 50 % phosphoric acid. However, the acid must be added at room temperature and stirred vigorously, otherwise the gold complex may decompose (localised over-acidification, brown "clouds" when acid is added).

Breaks in Operation / Storage of the Bath

Do not leave the bath open after use, but store it closed in PE, PP or PET containers. Select the bottle so that it is as full as possible. Oxygen in the air slowly oxidises the sulphite to sulphate. This results in gold deposits in dry areas of the container.

Baths left open for a longer period of time (weeks) can slowly turn purple (gold precipitation due to sulphite loss). The addition of ammonium sulphite can reverse the violet colouration, but not the gold precipitation. Any gold flakes or crumbs that have fallen out are filtered off, which does not affect the functionality of the bath. It is not necessary to work in the bath after breaks in operation. The shining additives in the bath also slowly oxidise when exposed to air. This can be recognised by brown and dull deposits. Then add approx. 5 ml **Gold-SF-shining-additive** / L to the bath.

Bath Monitoring

Normally, it is only advisable to check the pH value of open baths daily. During use, more sulphite is released from the gold complex than is oxidised, thus overcompensating for the air oxidation.

If the sulphite content (SO_3^{2-}) is to be determined after long periods of standstill, sulphite can be titrated with iodine after the gold has been masked with cyanide. It should be between 15 and 30 g / L.

The easiest way to calculate the residual gold content in the bath is via the amount of charge that has flowed. An analytical determination of the gold content can be carried out gravimetrically (precipitation of the gold from a bath sample with hydrogen peroxide and sulphuric acid, filtering and weighing) or using physical methods such as ICP.

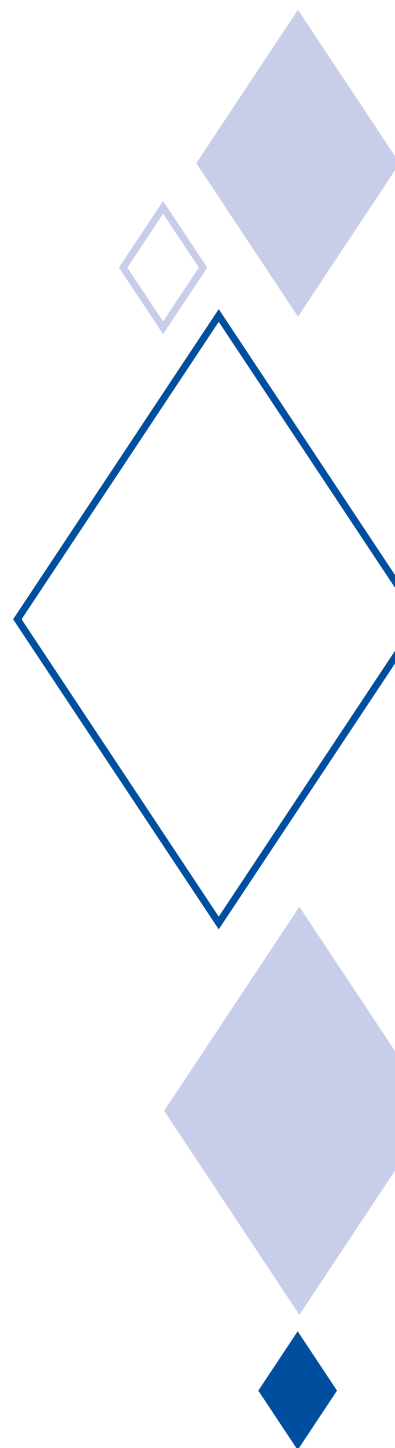
Analysis Rules

Sulphite control analysis: Add 1 ml of sample to 10 ml of deionised water, add 1 ml of 0.2 m KCN solution and acidify with acetic acid (pH 4). Then add a crumb of soluble starch and titrate with 0.1 n iodine solution until the blue colour begins to appear. 1 ml iodine solution corresponds to about 4 g sulphite.

Gold analysis: Dilute 50 ml bath with deionised water to approx. 150 ml and heat to boiling in a large, clean beaker glass with a beaker cover.

Acidify carefully (solution splashes) with sulphuric acid and oxidise the excess sulphite with hydrogen peroxide.

The gold turns out as a brown, voluminous cake. As soon as no further gold formation can be observed on further addition of sulphuric acid and/or hydrogen peroxide and the initial brown solution is colourless, the precipitation is complete. Filter off the gold, wash it salt-free and weigh it out in a porcelain casserole after ashing the filter paper.



Notes:

1. Never introduce cyanide into the bath.
Bath is destroyed. Rinse very well after cyanide pre-gold plating.
2. The bath can be completely worked out with decreasing current density without resulting in brown gold layers at the end.
If a continuous replenishment of the deposited gold is desired instead of finishing the bath, the bath can be worked through up to five times with Au replenishment solution. However, only a maximum of one third of the gold content should be worked out.
3. After initial non-shiny, brownish deposition, add brightener SF to the bath. The subsequent layers are shiny and gold-coloured again.

**For further information
please contact us:**

METAKEM
Precious metals & anodes

METAKEM GmbH

Achtzehnmorgenweg 3
61250 Usingen (Germany)

Phone: +49 (0) 6081-1060-0

Fax: +49 (0) 6081-1060-60

E-Mail: info@metakem.de

Web: www.metakem.de

