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# Ion Exchange Resin 400

Ion exchange resin is used for removal of metallic impurities suitable for all weak acidic gold bath and also for weak alkaline Pd bath. Resin is long life and can be regenerated with low loss of precious metal.

It is simple for removal of metallic impurities in precious metal baths. Most bi and trivalent metal cations are selectively removed at pH higher than pH 3. Due to selectivity, a very limited loss of precious metal will occur. After regeneration, the Ion Exchange resin can be reused several times.

**Operating conditions:**

Amount to be used: app.5-10ml of resin per 100mg of impurity.
Treatment time: app.1-3 hours.
Uptake capacity: depend on type and composition of the impurities
And the operating condition. Up to 40g of metal per lt of resin are possible.
Flow rate: in case of bypass operation, a max. flow rate of 20 times per hour.
Bath circulation: in the case of batch treatment at least 4 times per hour.
Temperature: as the bath temp.

**Process Hints:**

Analyse the required amount of Ion Exchange Resin.

The resin must be thoroughly rinsed with deionized water. The rinse water are app.10 times the resin volume. The gold bath is then cleaned at a flow rate max. 20 times the resin volume per hour. The treatment time for the bypass process usually should be 1-2 hours. Max.4 hours. After treatment has been carried out, the resin must be washed out with 10 times the resin volume of deionized water in order to prevent undesired reactions of the resin with the bath liquid.

We recommend to analytically control the precious metal content and the corresponding content of impurities before and after carrying out the cleaning.

**Practical Example:**

In case of the initial concentration of Ni of 150mg/lt in the batch operation a residual concentration of 1mg/lt of Ni could be reached after a 1-2 hous treatment using 6ml/lt of the resin. The gold content nearly unchanged.

**Regeneration and Conditioning:**

Before the uptake capacity of the resin is exhausted, a regeneration with a subsequent conditioning should be carried out. The precondition for an effective regeneration and conditioning is the use of a suitable resin column (e.g. Metallosorb) which can be operated downflow and counterflow! The regeneration and conditioning is carried out in six individual steps. Caution: An inclusion of cyanide containing compounds (e.g. potassium gold cyanide) is possible. Therefore the regeneration must be performed under an effective exhaust.

1. Rinsing with deionized water (removal of bath rests)
   Water requirements: approx. double the resin volume
   Flow rate: maximally 8 times the resin volume per hour

2. Regeneration with 10% sulphuric acid
   Acid requirements: double the resin volume
   Flow rate: maximally double the resin volume per hour downflow
   Hint: The resin volume will decrease by approx. 25%

3. Rinsing with deionized water until free from acidity
   Water requirements: 4 times the resin volume downflow
   Flow rate: maximally 8 times the resin volume per hour downflow

4. Conditioning with 4% sodium hydroxide solution
   Sodium hydroxide requirements: single the resin volume
   Flow rate: maximally double the resin volume per hour counterflow
   Attention: The resin volume will increase by approx. 25%

5. Mixing
   Stir in a separate container in order to produce a mixed bed. Duration at least 10 minutes

6. Rinsing with deionized water
   Water requirements: approx. 4 times the resin volume
   Flow rate: approx. 8 times the resin volume per hour

After this treatment sequence, the resin is again ready for use.