

## The FLUBOR Process – Hydrometallurgical recovery of lead from Galena-based concentrates

The main peculiarities of the **FLUBOR Process** are the following:

- Production of Pb and S
- Slag and SO<sub>2</sub> emissions cutting
- environmental impact reduction to very low values
- Limited consumption of fuel
- Environment safeguard in the workplace

The **FLUBOR Process** operates with a fluoboric acid based electrolyte. Fluoboric acid, is an excellent solvent for Pb.

The **FLUBOR Process** is composed by the following units:

- **The leaching:** it is an acidic oxidising leaching. Galena is contacted with a solution containing fluoboric acid and ferric fluoborate. The sulphur of the galena is oxidised to elemental sulphur while lead is taken in solution as lead fluoborate. This leaching is very selective and metals more noble than lead are kept into the leaching residue.
- **The electrowinning:** The solution coming out of the leaching unit is sent to a diaphragm divided cell in which in the cathodic compartment the lead is plated while, in the anodic compartment, the iron is oxidised to regenerate the leaching solution.
- **The bleed treatment:** it is based on the precipitation of metal sulphates of the impurities less noble than lead. In this unit the fluoboric acid consumed during the leaching by these elements is recovered to the process.
- **The residue treatment:** the sulphur contained in the residue is removed and recovered making this new residue available for the recovery of the other values contained in it.

All the steps of the process are patented.

Extensive lab and pilot testing has showed very good performances:

- Lead extraction rate is > 97 %
- The produced lead cathodes have a Pb content of 99.99 % free of Bi, Ag, Se, Te.
- The operating cost is very attractive and sensibly lower of the one of the thermal processes used nowadays

The scale up is very simple and the plant can be designed taking in consideration a possible expansion.