

## **Frank Baerhold: ACID REGENERATION TECHNOLOGIES**

Acid recovery is an important process step in pickling and leaching processes. Pyrohydrolysis in spray roasters and fluidized beds is a well-established technology to recover hydrochloric acid, but the hydrolysis in the liquid phase is more and more considered as an alternative new process route. The characteristic features of these three processes will be discussed.

The basic thermodynamics of the hydrolysis for pure metal chlorides and some mixtures will be shown as well as the behaviour of certain impurities and the implications on process design, materials of construction, and off-gas cleaning options.

Hydrochloric acid based leaching processes for ilmenite and nickel laterite ores produce far larger volumes of waste acid streams than the steel industry. Scaling-up of the spray roasting technology to the highest possible capacity is necessary in order to become more cost effective. Some design criteria will be discussed. In addition, process routes, e.g. based on ferric chloride pyrohydrolysis, allow the production of super-azeotropic HCl (up to 30 wt.%).

The new *ECOMode* concept optimizes the operation of both pickling/leaching lines and the spray roast acid recovery plant. Long term results from industrial applications show that fuel savings in the spray roaster of 25% are easily achieved without additional process steps. An attractive feature is also to upgrade existing installations to higher plant capacities.