

OSMO – new membrane procedure for lignin recovery

The new product, which was developed by OSMO in a major technical test series lasting several months, is a membrane procedure on the basis of ceramic ultra-filtration membranes to treat bleaching waste water from the paper and pulp industries. In accordance with the conditions existing at the customer, such as those of the bleaching process, the quantity of bleach waste water or the temperature level, etc., the turn-key plants can be used individually for CSB⁵ reduction with the simultaneous recovery of lignin. Fibres, solids and other soilings are removed by an integrated preliminary filtration station and the TS content is raised using a steaming unit to the desired concentration.

Lignin recovery – a future topic

The topic of lignin recovery is currently the subject of various research projects in particular in the paper and cellulose processing industries and the market opportunities for an effective procedure are regarded as very good. Both expert fairs and during personal meetings with experts from the paper industry, the new product of OSMO is being well received and two specific offers have already been made.

An official approval process is currently ongoing in Germany for the expansion of a production site of a large paper factory which includes the OSMO procedure. OSMO is, at least in Germany and Austria, therefore the first company that has managed to roll out the membrane procedure in this application on an industrial scale.

Clear reduction of the load degree of bleaching waste water

Lignin is a high-molecule three-dimensionally linked substance, which forms the development of wooded plants together with the cellulose and other polysaccharides. During the digestion of the wood, the originally insoluble lignin is broken down, made soluble and removed by cooking with other chemicals and by bleaching. The waste water arising in the process contains a high CSB load that is difficult to break down and is usually fed to multiple-stage waste water processing (anaerobic and aerobic steps of the waste water processing plant), while it is rarely possible to meet the legal feed-in values or to use the lignin concentrate on a commercial basis.

OSMO is the first company in Germany and Austria to roll out a new membrane procedure to recover lignin on an industrial scale.

The new procedure of OSMO now has both economic and ecological benefits. As the CSB content in waste water is now already reduced by about 40% before being fed into the prescribed waste water processing plant, it can be dimensioned on a far smaller scale. This has the benefit that both the costs for the plant technology and the running costs are a lot lower. On the other hand, when separating the CSB from the bleaching lye, high-quality and high-concentrate lignin sulphonate – in the case using the 100m³/h plant, this results in about 575 kg/h of lignin sulphate with a TS content⁶ of 40% – that is, amongst other things, used as an adhesive agent in wood pellet or in wood/chipboard production, but also as a replacement raw material in the production of glues, resins and filling substances or as an initial material for biodiesel production and currently needs to be produced in own processes.

OSMO has submitted its newly developed procedure on the basis of ceramic ultra-filtration membranes for the 2011 Environmental Technology Award of the State of Baden-Württemberg.

⁵ The chemical oxygen requirement (CSB) is a measure for the sum of all organic compounds in water, including those that are difficult to degrade.

⁶ Degree of drainage