



Development of a Phenol recovery system for processing water

During the period of time from 1st February 2014 to 31st July 2015 Sumitomo Bakelite Europe (Barcelona) SLU (SBEB) has been working on the project called “ **Development of a Phenol recovery system for processing water**”, which has been financed by the European Economic Area (EEA) for the programming period 2009-2014 in order to create programs for reducing the economic and social



disparities in the EEA and strengthening bilateral relations between the donor countries (ICELAND, LIECHENSTEIN Y NORWAY) and beneficiaries countries (certain EU countries, among which is Spain included).

The goal of the help is focused on research, development and innovation with priority on climate change and renewable energy sectors.

The project has received the collaboration from external institutions such as UAB-GTS (Autonomous Barcelona University-Separation Techniques Group), and private companies located in Europe and abroad.



It has been focused on studying the purification of waste water obtained in the production process of SBEB with free phenol content of 2-6% through a solvent extraction and replace

current procedure of by-product production and physical-chemical treatment by Fenton method which are part of the current waste water purification system.

It has been started with trials through extraction procedure with solvents used as raw material in production (cardanol, cashew nut shell liquid) with acceptable results on purification, but with an

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important disadvantage for the industrial application (interface with difficulties to be destroyed and too much solubility of water to these raw materials).

Trials went on with extraction with other organic solvent with the best results with one of them.

Project conclusions have been as follows:

- 1-The extraction with chosen extractant permits obtain a waste water free phenol content of 0-50 ppm, which is completely assimilated in biological treatment.
 - 2-There is a slightly solubility of extractant in water which generates an addition problem that means that water after extraction has an extractant content around 2-3%. With stripping techniques extractant content in water can reduce to 25-100 ppm and this level of concentration has been tested that is completely assimilated in biological treatment.
 - 3-The extractant is reusable in extraction system after distillation which permits separate from phenol obtaining results comparable with pure extractant.
- On the other hand, Phenol distilled (with slightly extractant content) can be used to produce phenolic resins successfully.
- 4-The industrial application with this extraction system is completely viable and for the moment there are two companies that offer installation and running-in of the system.

