

An Overview

Black liquid contains a large number of organic substances and inorganic substances, which are difficult to remove. Organic substances generally comprises lignin and its derivatives thereof, polysaccharides, alcohols, organic acids, resins, pectin, phenolic compounds, Among which lignin accounted for black liquid waste the total amount of 1% to 2%. Lignin can be generated worldwide each year about 600 trillion tons, is the largest human-dependent resources. This huge production of lignin, renewable, biodegradable natural polymers due to their complex structure, a polydispersity of macromolecular chemical properties and physical heterogeneity, so that it has not yet been fully and effectively utilized. Currently lignin can be used as industrial raw materials is mainly a byproduct of the paper industry, derived from pulping liquor, of which only one percent water-soluble lignin sulfonate such as primary industrial application, while a majority of the fuel burned away, such as the use of black liquid lignin as raw material, can produce as many as 200 kinds of lignin products, primarily a series of lignin of surfactants purpose for the comprehensive utilization of black liquor has opened up a new way.

Two principles

Lignin is a phenylpropyl group as the basic structural unit, having a network structure for a class of amorphous polymers, complex structure, molecular mass uneven, with the cellulose and hemicellulose with in plants, which is mainly the cell wall composition. Alkaline pulping process, the lignin macromolecule group water degradation and dissolved in the cooking solution, which is mainly phenol, a large amount of phenolic hydroxy ether fracture, there are more hydroxyl and carboxyl groups. In alkaline solution, a solution of sodium salt liquor after acidification, an ammonium ion substituted alkali lignin phenolic hydroxyl and carboxyl groups on the alkali lignin sodium ions of the yellow precipitate was hydrophobic state. Alkali lignin by different components of the pH fractionation, methoxy group content is reduced with a decrease in pH, a phenolic hydroxyl group and a carboxyl group increase when pH goes up. While the pH reaches 3, the lignin sufficiently precipitate. Room temperature, acidified black liquor lignin precipitated poor cohesion, like colloidal properties, separation very difficult. As the temperature rises, solid particles increases, and the precipitate was centrifuged and heat cohesion making it possible to filtration, after acidification and heat treatment so industrialized an important means of lignin extraction.

Three conclusions

Full use of the organic solvent and good solubility of organic solvents or volatile organic solvent separation, hydrolysis or dissolution of lignin, to achieve efficient separation of lignin and cellulose. Pulping waste produced can be recovered by distillation of the organic solvent, repeated recycling, no water or a small amount of waste water, forming a closed loop system that can actually control the pulp and paper from a source of environmental pollution, and can be purified by distillation lignin, lignin organic of high purity. The refined crude lignin, lignin can be obtained. Lignin is an important chemical raw material, commonly used in the oil industry to control the flow of drilling muds, and instead of phenol, made of Bakelite, lignin can be made to be stained brown corduroy cotton dyes. In addition, you can produce fish feed, humic ammonium fertilizers, plant growth, etc. or for coarse woody tangled sulfonated by SO_4 . Then the $\text{Ca}(\text{OH})_2$ neutralization, evaporation, drying, to obtain calcium lignosulfonate. The calcium lignosulfonate, the appropriate inclusion of certain additives, such as curing agents, dispersing agents, early strength agents, retarders, etc., can be made of a variety of different characteristics of

normal wood calcium concrete superplasticizer, it rigid material and the gas can be used as additives in cementitious materials.