Acid hydrolysis A

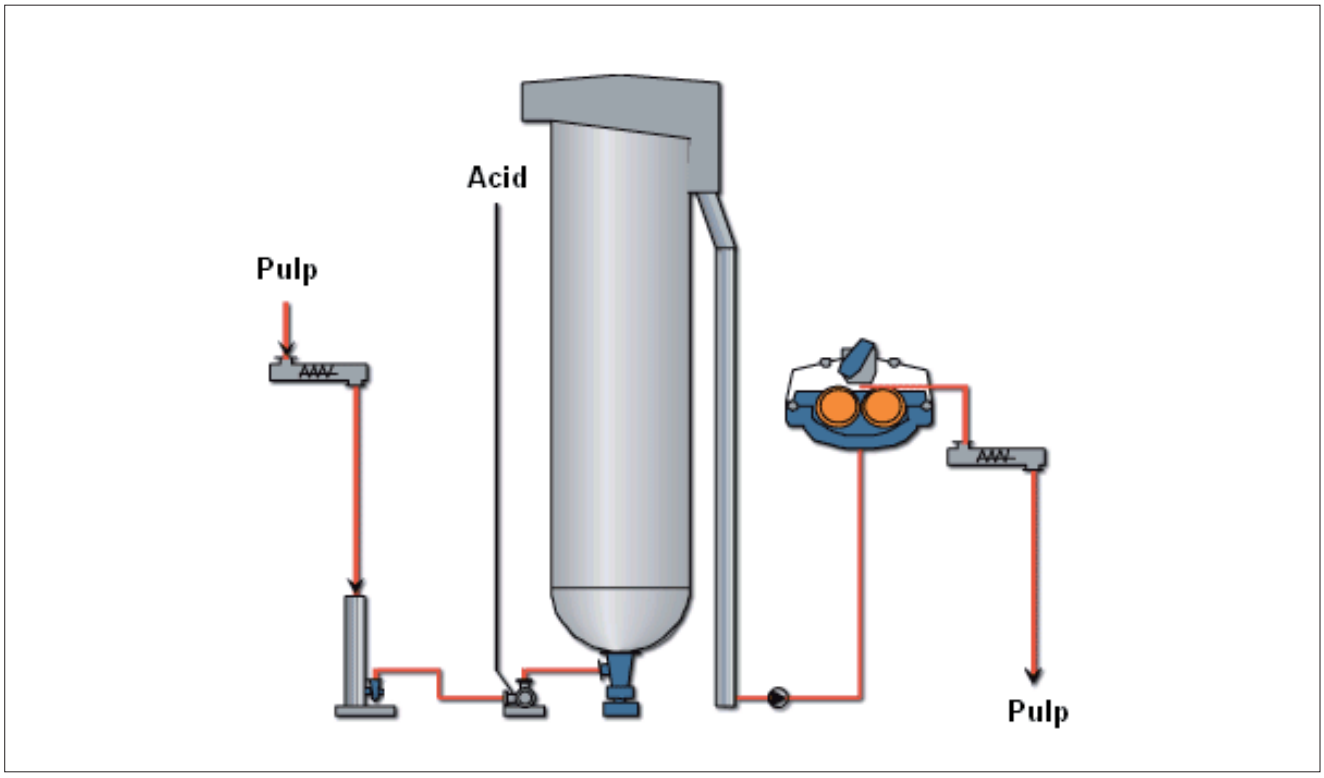

Fig. 1. Acid hydrolysis

Introduction

In acid hydrolysis stage pulp is treated with acid at high temperature. Acid hydrolysis removes harmful hexeuronic acids from the pulp. Stage A is located before bleaching and it can be done in a non-pressurized tank or a pressurized reactor.

The process

The proportion of hexeuronic acid (HexA) is considerable especially in hardwood pulps. HexAs consume bleaching chemicals, like chlorine dioxide, ozone and peracetic acid, just like lignin does. The hexenuronic acids in the pulp are removed with a mild acid hydrolysis in a medium consistency.

The treatment can be done in a storage tower, but the conditions are not as controllable as in a bleaching reactor. Retention time can be shortened in a bleaching reactor where the temperature can go above 100 °C. An ordinary pressurized reactor suits fine for the treatment.

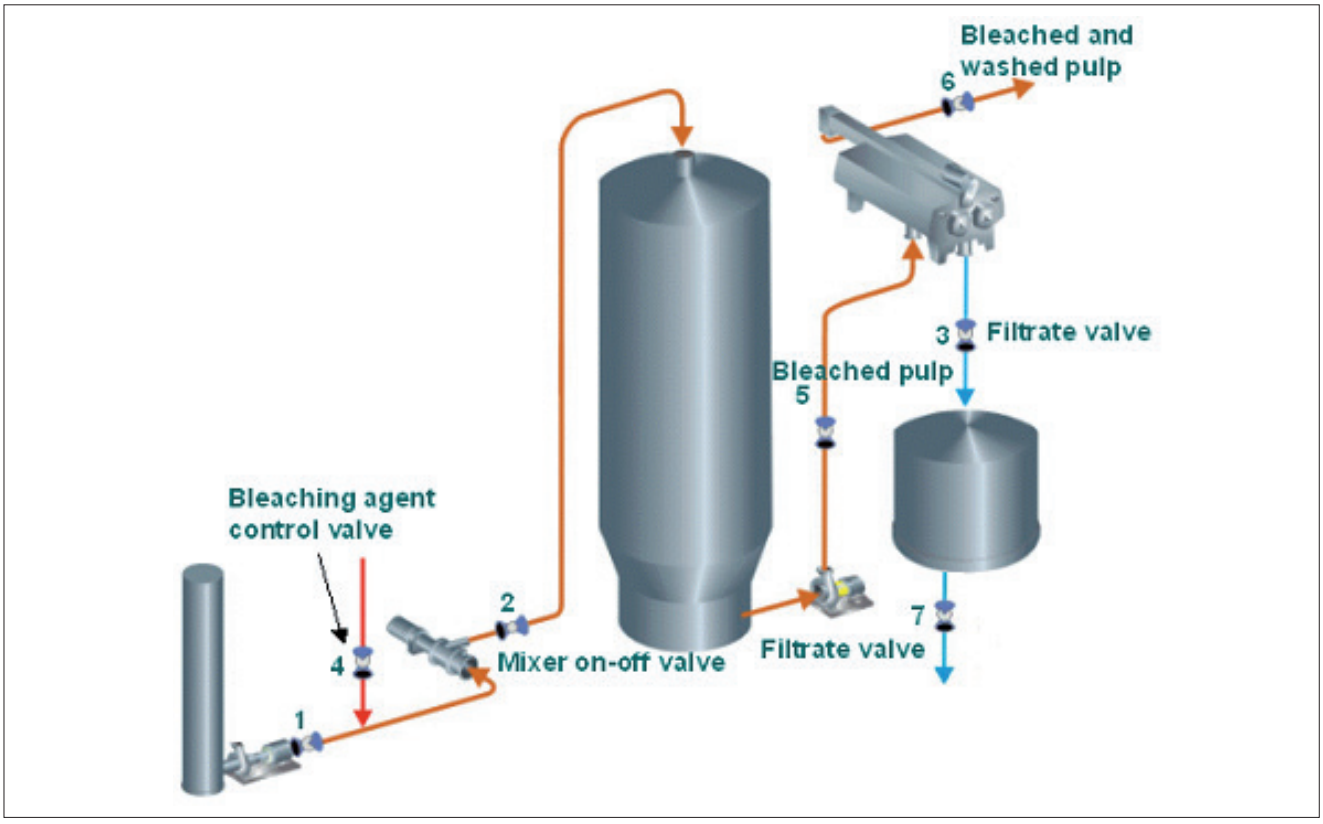

Fig. 2. Valves in acid hydrolysis.

Table 1. shows typical conditions in the acid hydrolysis bleaching stage.

Table 1. Conditions in acid hydrolysis.

pH	3 - 3.5
temperature	90 - 110 °C
time	1 - 3 h

Valves

Figure 2. shows valves in the acid hydrolysis bleaching stage.

Pulp flow is controlled by MC control segment valve. Acid is added to the process before mixer. Pulp and acid are mixed in the mixer as a homogenous compound. That compound is fed to a bleaching tower through mixer on-off valve.

After retention pulp is fed to the final washing system where chemical left over and water soluble reaction products are removed. After pulp washing it is conducted to the next bleaching stage. Filtrate valves give out used chemicals to treatment. Depending on the process, valves 3, 5 and 6 are not always used.

CF8M is a common material for pulp control valves. However MC control valve is made of CG8M which tolerates corrosion a bit better. Mixer on-off valve is PTFE lined for better corrosion resistance as well. CW6M is used with acid because it has excellent corrosion resistance in acidic services.

Table 2. gives valve types and materials (example materials are in brackets). Pressure ratings are sized by pump sizes.

Table 2. Valve types and materials.

Valve	Name	Type	Material	E.g.
1	MC control valve	Segment	CG8M (317 SS)	R2_S…CJJK
2	Mixer on-off valve	Ball	PTFE Lined	
3	Filtrate valve	Segment or butterfly	CW6M (Hastelloy C)	LW7_BA...HHH1KT
4	Bleaching agent control valve	Ball or Segment	CW6M or CF8M*	RE_A...AJJST
5	Bleached pulp	Ball or segment	CF8M (316 SS)	RE_A...AJJST
6	Bleached and washed pulp	Segment or butterfly	CW6M	LW7_BA...HHH1KT
7	Filtrate valve	Segment or butterfly	CF8M	LW7_BA...AAJAT

* Depends on the concentration of the agent.

Valmet Flow Control Oy
Vanha Porvoontie 229, 01380 Vantaa, Finland.
Tel. +358 10 417 5000.
www.valmet.com/flowcontrol