Biocide

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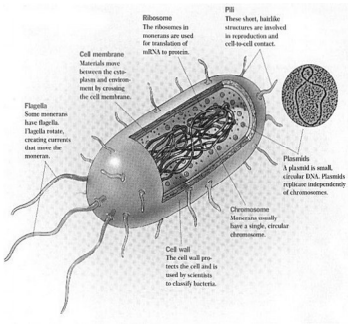
In the paper making industry, biocide is classified as an Anti-fouling agent used to control the undesirable accumulation of micro-organism, plant and animal secretions or discharge which might affect the quality of paper or the runability of its production machines. Of the large group of biocides which ranges from Preservatives, Insecticide, Pest control chemicals and Disinfectants, Slimicide is of utmost interest to a Paper Maker. As it prefix suggests, slimicides are chemical agents that will control the growth of slime forming organisms. To exterminate the entire slime forming populace of micro-organism in the water flow system of paper making is both impractical and cost-prohibitive, therefore a more viable approach is to i)Limit the growth of slime-forming organism to a safe level which is called Bio-static control or ii)To avert the build-up of problematic slime. By limiting the growth of slime forming organism, one has to engage the use of high toxicity chemicals which can be generally classified into Oxidizing and Non-oxidizing biocides. As the name suggests, oxidizing biocides are biocide that kills with the help of an oxygen or a proton donor. E.g. of these types of biocides are Hydrogen Peroxide, Hypo, Chlorine gas, Calcium perchlorate. These oxidizing biocides are uncommon in paper making as they not only corrode the paper machines but it affects the water chemistry of its manufacturing. Non-oxidizing biocides are more popularly used because it is more compatible to the chemistry of paper making. The class of biocides entails Chloroamines, thiocynate, organometallics, carbamates and other novelty organic chemical.



Non-oxidizing biocide are of great interest to a paper chemist by virtue of its diversities and biocidal potency. Some biocides may be effective for slime control of a particular specie but is relatively impotent to the next

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spp. And it is a known fact that bacteria does evolve to build up resistance to the pro-longed use of a single biocide. Therefore it is always a battle between an evolving bacteria and chemist. For effective biological control of water system in paper making, a chemist has to perpetually find new biocides or concoctions of biocides to fight the bio-fouling agent. A combination of biocide has to be formulated to tackle specific slime problem. Locations where the biocide is fed can also determine the success of failure of a biocide treatment problem. As biocides are toxic, lowering of its dosage would save cost and lower COD/BOD loading on waste water, some chemists resort to develop biocide enhancers. These chemicals act on the cell wall of fouling bacteria to allow the biocide to enter its body more readily to targeted areas of attack on mitochondria or RNA of the host.

As the world is getting more environmental conscious, the use of toxic chemical like biocides is under scrutiny. The chemist is pressured to do away with the hazardous chemical and to find more eco-friendly products, thus emerge the next category of weaker biocides like quaternary ammonium chlorides which are less toxic yet capable of arresting the slime problem. This group of chemical is basically surfactant that will halt the build-up of slime by attacking the polysaccharides coating of the slime secreted by the micro-organisms. The hydrophobic slimes formed by micro-organism is prevented from agglomeration by ionic charging of the surfactant molecules. This approach is getting more common these days.

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