Formation Aids

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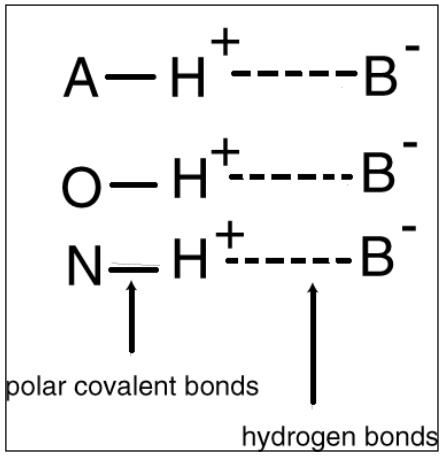
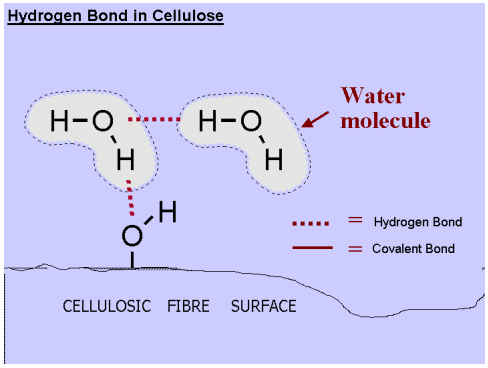
In the making of thin papers like copying, tissue and cigarette wrappings, uniform distribution of bonded fibre in the paper sheet is an important criterion for grading which ultimately determine its pricing. A high quality products with good formation can command better pricing. For high turbulent, high speed paper machines, formation is not a problem as high hydro-kinetic energy can supercede the weak intermolecular hydrogen bond between cellulosic fibre to ascertain well scattered individual fiber strands. In slow machines, without this high energy input, inter-fibre hydrogen bonds can build up clusters of fibre lump which can eventually end up in the final paper to affect its formation. Therefore smaller and slower machines will have to rely on chemical to help them to improve on formation.



Cellulosic fibre are anionic by nature. The use of anionic polymers to increase the repulsing charge of the fibre can prevent the lump formation. There are limitations on the use of anionic hydrophilic polymer for improved formation. Un-utilized polymer can add up to the amount of anionic trash of white water making its other functional additive less effective. The use of non-ionic hydrophilic polymer as formation aids has been pioneered by the Japanese paper makers for decades now. They have replaced the negatively charged polymer with neutral charge PEO or Polyethylene oxide. MMW Polyethylene oxide has an affinity to build up hydrogen bonds with natural fibre to enlarge its bulk. Larger fibre strands are less likely to form cluster than small strands. Theoretically higher MW PEO will have higher potency for fibre dispersion; But as PEO are non-ionic, high MW polymer will be difficult to dissolve in water, thus only MMW of less than 5,000,000 are useful as dispersion or formation aids for low basic weight papers.



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