

식물유래 섬유자원의 재활용: 탈묵 수율 개선을 위한 신문 지료의 수화 촉진 방안

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Recycling of Plant Fiber Resources: Enhanced Hydration of Newspaper Stock for Decrease of Deinking Reject

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ABSTRACT

The recycling rate of recovered paper in Korea is the highest in the world, 92%, but remanufacturing yield is low due to the extremely poor quality of the paper. The poor quality, in turn, influences to the reject amount in deinking process. To increase the yield of old newspaper recycling process, hydrophobic degree of inorganic pigments of deinking stock must be reduced.

To determine the hydrophobicity, Pitch Potential Deposit Tester (PDT) was newly designed and applied with respect to the SB latex property of various quality used in Korea; its hydrophobic degree according to Tg, gel content, charge and particle size of latex and optimum designing condition of SB latex. And below are the conclusions:

1. The reason of excessive reject from old newspaper deinking process for total

amount of printed ink is loss of inorganic pigments. When lipase, a biochemical catalyst, was applied with the purpose of preventing inorganic pigments loss about more than 70% of total reject weight and promoting hydration of pulp for deinking, deinking process yield of pre flotation secondary stage increased remarkably without any changes of deinking efficiency.

2. Lipase improved deinking stock by cutting ester linkage on surface of hydrophobic materials to promote its hydration. From this, it reached the conclusion that hydration degree of stock exercises significant effect on flotation deinking process yield.
3. Inorganic alkali promotes hydration of deinking stock. But there have been needs for more fundamental measures other than inorganic alkali of promoting hydration for yield improvement. For this, this study intended to find out reasons of chemical properties change on surface of hydrophobic material by change of pH.
4. Pitch Deposit Test (PDT) was performed for understanding principle of why surface of coating flake from OMG is hydrophobic and why it becomes hydrophilic when pH of stock is alkaline. As a result of this test, it is determined that swelling property by change of pH of latex film, which were used as coating adhesive is the reason for hydrophobic change.
5. Hydrophilicity of coating flake increased with hydrophilic pigments. And as more of SB Latex adhesive was used and higher of calcium hardness of stock became, its hydrophilicity decreased. SB Latex adhesive film is reformed by mechanical friction. For having hydrophilicity under neutral pH, strong bruising action such as kneading is required.
6. Because swelling of adhesive film decreases as Tg of SB latex gets lower and

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mean diameter gets smaller, it shows hydrophobicity under neutral pH. This lowers hydrophilicity of coating flake, which leads to easy elimination with flotation reject on DIP process. Therefore, for improving future flotation yield, it is necessary to develop to use eco-friendly clean SB latex by raising Tg and increasing mean diameter for recycling, and as a result, to reduce excessive loss of coating flake as a reject from deinking process.

Keywords : Deinking, ONP, Hydration, Yield, Recycling

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