

# 전도냉각형 고온초전도 자석을 이용한 제지폐수의 자기분리에 의한 정수

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## Purification of wastewater from paper factory by cryo-cooled high-T<sub>c</sub> superconducting magnetic separator

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**Abstract :** Paper factories use a large amount of water and same amount of wastewater is generated. It is important to recycle the wastewater because of water shortages and water pollution. The existing water treatment facilities like precipitation process need large-scale equipment and wide space to purify the wastewater of paper factory. High gradient magnetic separation (HGMS) system has the merits to purify rapidly because of large voids at filter and to occupy small space.

In this paper, two types of superconducting magnets were used for HGMS systems. Cryo-cooled Bi-2223 superconducting magnet system with 70 mm room temperature bore and 200 mm of height was prepared. Cryo-cooled Nb-Ti superconducting magnet with 100 mm room temperature bore and 600 mm of height was used for magnetic separator. Magnetic filters were designed by the analysis of magnetic field distribution at superconducting magnets. The various magnetic seeding reactions were investigated to increase the reactivity of coagulation. The effects of magnetic separation of wastewater were investigated as variation of magnetic field strength and flow rate of wastewater.

**Key Words :** Magnetic separation, Cryo-cooled superconducting magnet, Paper factory, Wastewater

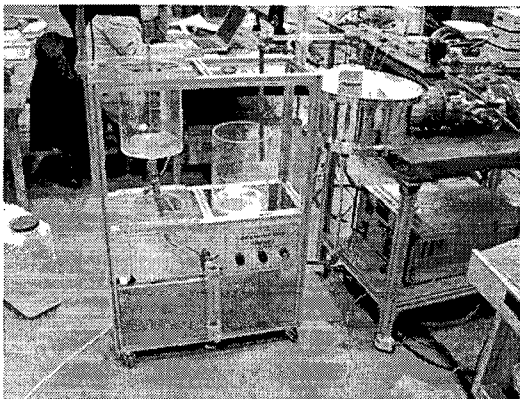


Fig. 1 Magnetic separator with 3T class of High-T<sub>c</sub> superconducting magnet

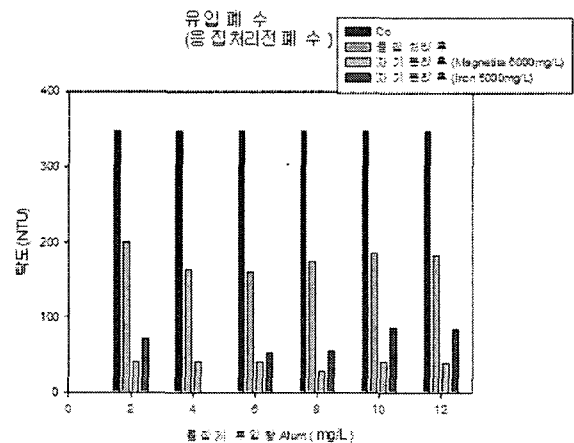


Fig. 2 Turbidity of paper factory's wastewater after magnetic separation.