

Cryogen-Free Superconducting Magnet and Magnetic Separation

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We have developed cryogen-free superconducting magnet which is cooled by conduction cooling using G.M. cooler. Since the SC magnet is cooled to around 4 K without LHe or LN₂, it is convenient for maintenance and long term operation over several months. Generally, under magnetic field, in manufacturing processes of materials, crystal growth, chemical synthesis process and biological experiments, the processes continues from several hours some times to several weeks in constant conditions. When the cryogen-free superconducting magnet is used for the experiments, liquid He transfer is not necessary to keep the low temperature, therefor we can save the energy to maintain the system and expensive liquid He.

We applied the cryogen-free superconducting magnet into the treatment of contaminated wastewater by magnetic separation method. Under the 3 T of the magnetic field the metal contaminated wastewater is treated successfully. In the conference the experimental results are presented.

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