

The fiber stainless steel recycle from grinding swarf by using binary supercritical fluid mixture  
(carbon dioxide + propane)

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Supercritical fluids extraction has gained widely acceptance as the method for removal. It has many advantages of low waste production, rapid extraction, enhanced extraction efficiency for waste removal. There are four processes in steel manufacturing process. They are iron making, steel making, continuous casting, and rolling process. Particularly, because grinding swarf produced from the rolling process has cutting oil over 10% of total weight, it is classified as a specified waste. If successful procedure can be implemented to separate and recycle the steel and cutting oil from raw swarf, it will be turned into high-grade steel that can be applied to various fields of metal material. In this work, we used binary supercritical fluid mixture(carbon dioxide + propane) as a solvent in order to remove cutting oil from raw swarf. This experiments were performed in the temperature ranges from 30 to 50°C and pressure ranges from 10 to 30MPa. The weight of propane in supercritical is 5%,10% and 20%, respectively. In addition, the characteristics of swarf particles treated with supercritical fluid were compared with those treated with vacuum thermal extraction.