

Practical Method for Bentonite Recovery from Foundry Sand Dust

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Making and utilization of foundry sand molds are always accompanied by generation of foundry sand dusts. In 2010, about 13,000 tons of non hazardous foundry sand waste from iron and steel industries was generated in Thailand. By law, generators must disposed of the waste in industrial landfills although the dust still contain approximately 10-30% of bentonite by weight. Active bentonite is normally acquired and used as a binding agent for making green sand mold. Therefore, instead of paying for the disposal fee, we aimed to recover active bentonite from foundry sand dust. Dust samples were collected from baghouse filters of a large iron foundry factory. Framework for experiments was set up and consists of toxicity test, dust characterization, and determination of optimal values of temperature and duration for heat application. From the toxicity test we found that heavy metal concentrations in the foundry sand dust leachant were within the regulatory limits. Dust characterization revealed that most dusts were still coated by active bentonite at room temperature. Optimal condition of bentonite recovery was at 120 degree celcius and 30 minutes for heat application. The recovery percent of active bentonite mass was at 41.52 at the purity percent of 26.34. Therefore, about half of the original amount of active bentonite present in the waste dust can be recovered for use again. In addition, the diversion of active bentonite mass from waste dust also can result in saving for the disposal cost.