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Recovery of ferrous and nonferrous metal from ASR by physical separation

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A recycle ratio of waste automobiles in Korea is low, compared to that of the advanced countries. Especially in its recycle, separation of automotive shredder residue (ASR), the residual fraction of approximate 25% obtained after dismantling and shredding from waste car, is needed. However ASR is cannot be effectively separated due to its heterogeneous materials and coated or laminated complexes and then is largely deposited in land-fill sites as waste. In this study ASR was separated by a series of physical processing operations such as comminution, air classification and magnetic separation and electrostatic separations. In particular it focuses on estimating the optimal conditions of magnetic and electrostatic separations for improving the separation efficiency of valuable ferrous and non-ferrous metals such as iron (Fe), aluminum, copper and etc. In magnetic separation, 91.5% Fe grade and 91% recovery could be obtained at conditions of particle size under 10mm and magnetic intensity of 400 gauss. In corona electrostatic separation for recovering nonferrous metals, a grade of 79.2% and recovery of 90.7% could be successfully achieved under conditions of -6mm particle size, 50kV electrode potential, 35rpm drum speed and 20 degree splitter position, respectively.

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