

Recovery of Au and Other Metals from Old Electronic Components by Leaching and Liquid Extraction Process

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Abstract : Old electronic components can be easily found nowadays. Significant quantities of valuable metals such as gold, silver or copper are used for the production of advanced electronic devices. Old useless electronic device slowly became a new source of precious metals, very often more efficient than natural. For example, it is possible to recover more gold from 1-ton personal computers than seventeen tons of gold ore. It makes urban mining industry very profitable and necessary for sustainable development. For the recovery of metals from waste of electronic equipment, various treatment options based on conventional physical, hydrometallurgical and pyrometallurgical processes are available. In this group hydrometallurgy processes with their relatively low capital cost, low environmental impact, potential for high metal recoveries and suitability for small scale applications, are very promising options. Institute of Nuclear Chemistry and Technology has great experience in hydrometallurgy processes especially focused on recovery metals from industrial and agricultural wastes. At the moment, urban mining project is carried out. The method of effective recovery of valuable metals from central processing units (CPU) components has been developed. The principal processes such as acidic leaching and solvent extraction were used for precious metals recovery from old processors and graphic cards. Electronic components were treated by acidic solution at various conditions. Optimal acid concentration, time of the process and temperature were selected. Precious metals have been extracted to the aqueous phase. At the next step, metals were selectively extracted by organic solvents such as oximes or tributyl phosphate (TBP) etc. Multistage mixer-settler equipment was used. The process was optimized.

Keywords : electronic waste, leaching, hydrometallurgy, metal recovery, solvent extraction

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