

Recovery of valuable metals from spent solar cells by solvent extraction

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A nitrate solution containing Ag(I), Pb(II) and Al(III) was obtained in leaching procedure of silicon solar cell. In order to recover Ag(I) from this leach solution, solvent extraction with Trioctylphosphine oxide (TOPO) experiments were carried out. TOPO was found to have selectivity on Ag(I) and Pb(II) over Al(III) at lower nitric acid solution. Most of Ag(I), Pb(II) together with small amount of Al(III) was extracted with 1 mol/L TOPO from the leachate solution. Ammonia water was able to selectively strip Ag(I) from the loaded TOPO, while the loaded TOPO can be regenerated after stripping of Pb(II) and Al(III) with thiourea and HNO₃, sequentially. A process flow sheet for Ag(I), Pb(II) and Al(III) recovery from the nitrate leach solution was proposed.