

M²M²e²R

Minerals and Metals Recycling Research Centre



Identification and Recovery of Rare Metals in Electric and Electronic Scrap

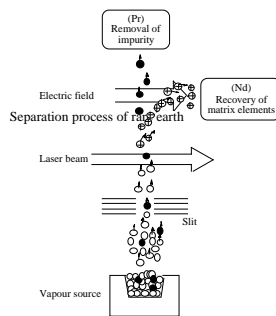
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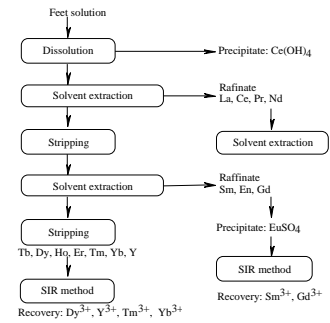


Evolution of EEE consumption in EU

Laser Materials Purification process (LMP) to recover rare earth elements



Separation process of rare earth



References

1. <http://www.re-zone.gov.cn/en/ud/intr.htm>
2. Junji Shibata and Shigeno Matsumoto, "Separation of Dy, Y, Tm, and Yb from heavy rare earth residue with solvent impregnated resin", EPD 1998, 83 - 93.
3. Furubayashi E., Hasegawa R., Ozaki T., Goto K., Ogawa Y., Honda K., Kamihira K. and Yoshimatsu S. "High Purification of Rare Earth Metals by Physical Methods", <http://www.nrim.go.jp:8080/public/english/act/1991.024.html>.
4. Douglas A. Skoog, F. James Holler and Timothy A. Nieman, "Principals of Instrumental Analysis", Fifth Edition, 1998.
5. <http://www.geocities.com/ResearchTriangle/Lab/2277/preface.html>
6. J.B. Legarth, L. Alting, B. Danzer, D. Tartler, K. Brodersen, H. Scheller and K. Feldman, "A New strategy in the recycling of printed circuit board" J of Circuit World, v.21 N°3,95,10-15
7. Per Hedemalm, Per Carlsson and Viveka Palm, "A survey of the contents of materials and hazardous substances in electric and electronic products", Environment, Tema Nord 1995:554.
8. Frank E. Mark and Theo Lehner, "Plastics Recovery from Waste Electrical and Electronic Equipment in Non Ferrous Metal Processes."
9. http://biz.yahoo.com/bw/010925/251184_1.html
10. <http://www.iht.tuwien.ac.at/sat/base/ecolife/ECOOtherActivities.html>
11. Management of waste electronic appliances, August 1995, Minnesota office of environmental assistance, report.
12. Hong -Chao Zhang and Frederick Ling, "A decision - Making Model for Materials Management of End-of-Life Products in the Pantex Plant", report, ANRCP-1999-27, Amarillo National Resource Center for Plutonium, USA.