**EcoBatRec: Recycling of (H)EV Li-ion Batteries**

**Motivation and Target of the EcoBatRec Project:**
- spent batteries contain high valuable secondary raw materials
- recycling is prescribed by EU Battery Directive 2006/66/EC
- recovery of all valuable materials including lithium necessary

**Material throughput**

**Li-ion Battery**

- Dissasembling to cells
- Autothermal pyrolysis
- Multistep subsequent and linked mechanical treatment

**Module (wt.%)**

- Cells 50.4%
- Plastic 11.2%
- Steel 18.9%
- Cu 8%
- Elect.Comp. 3.6%

**Cell (wt.%)**

- Organsics, graphite 45%
- Al 24.5%
- Li 4%
- Cu 19%
- Co, Ni, Mn 3.2%

**Electrode mass powder**

- Vacuum evaporation of Li ¹)
- Entraining gas evaporation of Li ²)

**Electrode mass powder**

- Lithium metal
- Lithium oxide

**Summary:**
- Through the development and piloting of the EcoBatRec project, first time in a Li-ion battery recycling process, is a cost-effective processing combined with a maximized recovery of valuable metals
- Simultaneously can be achieved high recycling rates with marketable products, through the use of an adaptive, advanced and cost-effective mechanical treatment process
- The EcoBatRec recycling process is geared to the targets of a universal, material-efficient, economically and ecologically optimized procedure

¹) Direct vacuum evaporation of Li and recovery of metallic Li by distillation
²) Selective entraining gas evaporation of Li and recovery of lithium oxide

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