Claims

1. Process for the concentration of lithium in metallurgical fumes is described, comprising the steps of:
- providing a metallurgical molten bath furnace;
- preparing a metallurgical charge comprising lithium-bearing material, transition metals, and fluxing agents;
- smelting the metallurgical charge and fluxing agents in reducing conditions in said furnace, thereby obtaining a molten bath with an alloy and a slag phase; and,
- optionally separating the alloy and the slag phase;
characterized in that a major part of the lithium is fumed as LiCl from the molten slag, by addition of alkali and/or alkaline earth chloride to the process.

2. Process according to claim 1, wherein the alkali and/or alkaline earth chloride is added to the process as part of the metallurgical charge, or as part of the fluxing agents, or added to the liquid slag during or after smelting.

3. Process according to claims 1 or 2, wherein the alkali and/or alkaline earth chloride is added in an amount corresponding to a stoichiometric excess with respect to the Li in the fumes.

4. Process according to claim 3, wherein the stoichiometric excess of alkali and/or alkaline earth chloride amounts to at least 10%.

5. Process according to any one of claims 1 to 4, wherein the alkali and/or alkaline earth chloride is $CaCl_2$.

6. Process according to any one of claims 1 to 5, wherein the lithium-bearing material also contains nickel and/or cobalt, and wherein a pO_2 is maintained that is sufficiently low to reduce a major part of at least one of nickel and cobalt to the alloy phase.

7. Process according to claim 6, wherein the lithium-bearing material comprises Li batteries, their scrap, or their production waste.