CLAIMS

1. A method of producing lithium hexafluorophosphate ($LiPF_6$) in solid form, the method including reacting lithium fluoride (LiF) in solid form with gaseous phosphorous pentafluoride (PF_5), wherein the reaction is performed in a liquid perhalogenated organic compound that is inert to the PF_5 and is a solvent for the PF_5, thereby producing $LiPF_6$ in solid form.

2. The method according to claim 1, wherein reacting the LiF with gaseous PF_5 includes

dispersing the LiF in solid form in the liquid medium; and

dissolving gaseous PF_5 in the liquid medium containing the LiF in solid form.

3. The method according to any of claims 1 to ~~3~~2, wherein the perhalogenated organic compound is a perfluorocarbon.

4. The method according to claim 3, wherein the perfluorocarbon is selected from cyclic and non-cyclic perfluoroalkanes, and cyclic and non-cyclic perfluoroalkenes, and mixtures of any two or more thereof, severally or jointly.

5. The method according to any of claims 1 to 4, wherein the perfluorocarbon is selected from perfluorodecalin, perfluoroheptane, hexafluorobenzene, tetrafluoroethylene, and mixtures of any two or more thereof.

~~6. Solid $LiPF_6$ produced according to the method of any of claims 1 to 5~~

~~7~~6. A method of producing an electrolyte, the method including producing $LiPF_6$ in solid form according to the method of claims 1 to 5; and dissolving the $LiPF_6$ in solid form in a solvent for $LiPF_6$.

~~8~~7. The method according to claim ~~5~~6, wherein the solvent for $LiPF_6$ is selected from ethylene carbonate, propylene carbonate, dimethyl carbonate, dimethyl ether, and mixtures thereof.

~~9. An electrolyte produced according to the method of claim 7 or claim 8.~~

~~10~~8. A method of manufacturing an electric battery, the method including producing an electrolyte according to the method of claim ~~7~~ 6 or claim ~~8~~7; and including the electrolyte in an electric battery.