

## Supplementary Information

### Characterization of Lithium Phosphorus Oxide Thin Film Libraries by Laser-Induced Breakdown Spectroscopy Imaging: A Step Towards High-Throughput Quantitative Analyses

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- Specific data on Gate and Gain for each spectrometer

**Table S1.** Features of each of the three spectrometers

	Spectro 1	Spectro 2	Spectro 3
Wavelength (nm)	164-236	380-467	390-520
Gate (ns)	5000	5000	500
Delay (us)	1	1	1
Gain	200	500	1

- Calculation regarding detectable Li and P amounts ablated with one laser shot
  - (i) The precise density of amorphous  $\text{Li}_{2.3}\text{PO}_{3.65}$  is unknown, but it is expected to be close of those of crystalline  $\text{Li}_4\text{P}_2\text{O}_7$  and  $\text{Li}_3\text{PO}_4$ , i.e. 2.3 and 2.5  $\text{g}\cdot\text{cm}^{-3}$  respectively. Therefore, the approximate value of 2.4 was used in the calculation. Its molar mass is  $2.3 \times 6.94 + 30.97 + 3.65 \times 16 = 105.33 \text{ g}\cdot\text{mol}^{-1}$ .
  - (ii) Steady state deposition rate of  $\text{Li}_{2.3}\text{PO}_{3.65}$  in the present sputtering conditions is 115-120  $\text{nm}\cdot\text{h}^{-1}$ , or 2  $\text{nm}\cdot\text{min}^{-1}$
  - (iii) Therefore, the amount of  $\text{Li}_{2.3}\text{PO}_{3.65}$  material deposited during 2 min corresponds to a 4 nm-thick layer.
  - (iv) The volume of  $\text{Li}_{2.3}\text{PO}_{3.65}$  material ablated on a spot of 12  $\mu\text{m}$  in diameter (and 7  $\mu\text{m}$  deep) is equal to  $\pi \times (12 \cdot 10^{-4})^2 / 4 \times (4 \cdot 10^{-7}) = 452 \cdot 10^{-15} \text{ cm}^3$
  - (v) This corresponds to  $452 \cdot 10^{-15} \times 2.4 / 105.33 = 10.3 \cdot 10^{-15} \text{ mol}$
  - (vi) And to  $2.3 \times 6.94 \times 10.3 \cdot 10^{-15} = 157.10^{-15} \text{ g}$  or 0.157 pg of Li, and  $30.97 \times 10.3 \cdot 10^{-15} = 319.10^{-15} \text{ g}$  or 0.319 pg of P