Supporting Information

Unveiling Crucial Morphological Effect of Non-conducting

Polymer Binders on Inorganic-rich Hybrid Electrolytes

Natalia Stankiewicz^a, Leon Focks^{b,c}, Mengyang Cui^c, Mercedes Fernandez^d, Evgenii Modin^e,

Amaia Iturrospe^f, Oier Pajuelo-Corral^a, Erik Simon^g, Arantxa Arbe^f, Peter Siffalovic^g,

Gillian R. Goward^c, Andrey Chuvilin^e, Irune Villaluenga^{a,h}*

^aPOLYMAT and Department of Applied Chemistry, Faculty of Chemistry, University of the Basque Country UPV/EHU, Paseo Manuel de Lardizábal 3, 20018 Donostia-San Sebastián, Spain

^bInstitute of Physical Chemistry, University of Münster, Correnstrasse 28, D-48149 Münster, Germany

^cDepartment of Chemistry & Chemical Biology, McMaster University, Hamilton, Ontario, Canada L8S 4L8

^dPOLYMAT, University of the Basque Country UPV/EHU, Joxe Mari Korta Center, Avda. Tolosa, 72, 20018 Donostia-San Sebastian, Spain

°CIC nanoGUNE BRTA, Tolosa Hiribidea, 76, 20018 Donostia-San SebastiánSan Sebastián, 20012 Basque Country, Spain

^fCentro de Física de Materiales (CSIC-UPV/EHU) – Materials Physics Center (MPC), Manuel Lardizabal Ibilbidea 5, 20018 Donostia-San Sebastián, Spain

^gCentre for advanced materials application (CEMEA), Slovak Academy of Sciences, Dúbravská cesta 9, Bratislava 84511, Slovakia

^hIKERBASQUE, Basque Foundation for Science, Plaza Euskadi 5, 48009 Bilbao, Spain

Corresponding author:

*E-mail: irune.villaluenga@ehu.eus



Figure S1. Rietveld refinements of the XRD pattern of Li₃InCl₆.

Table S1. Crystallographic data of Li_3InCL_6 and corresponding refined parameters based on XRD.

Space group	C2/m		
a (Å)	6.3935(5)		
b (Å)	11.1385(4)		
c (Å)	6.3595(5)		
β (°)	109.6889(6)		
Volume (Å ³)	426.41(5)		
Chi2	9.48		
Rwp, %	10.78		
Rp, %	8.26		

Atom	х	У	Z	Occupancy	U	Site
Cl1	0.2450	0.0000	-0.2376	1.000	0.03	4i
C12	0.2841	0.1658	0.2470	1.000	0.03	8j
In1	0.0000	0.3333	0.0000	0.53	0.03	4g
Li1	0.5000	0.0000	0.5000	1.000	0.03	2d
Li2	0.0000	0.16830	0.5000	1.000	0.03	4h

Table S2. Rietveld refinement analysis results for the XRD pattern.



Figure S2. Rietveld refinements of the WAXS pattern of Li₃InCl₆.

Table S3. Crystallographic data of Li_3InCL_6 and corresponding refined parameters based on WAXS pattern.

Space group	C2/m		
a (Å)	6.3799(3)		
b (Å)	11.0311(2)		
c (Å)	6.2725(2)		
B (°)	109.4634(4)		

Volume (Å ³)	416.22(3)
Chi2	2.14
Rwp, %	7.22
Rp, %	6.59

Table S4. Rietveld refinement analysis results for the WAXS pattern.

Atom	Х	У	Z	Occupancy	U	Site
Cl1	0.2450	0.0000	-0.2399	1.000	0.03	4i
Cl2	0.2421	0.1657	0.2399	1.000	0.03	8j
In1	0.0000	0.3333	0.0000	0.53	0.03	4g
Lil	0.5000	0.0000	0.5000	1.000	0.03	2d
Li2	0.0000	0.16830	0.5000	1.000	0.03	4h

References

 Sacci, R. L., Bennett, T. H., Drews, A. R., Anandan, V., Kirkham, M. J., Daemen, L. L., & Nanda, J. (2021). Phase evolution during lithium-indium halide superionic conductor dehydration. Journal of Materials Chemistry A, 9(2), 990–996. https://doi.org/10.1039/d0ta10012a