

Supporting Information

Synthesis and characterization of Na₃SbS₄ solid electrolytes via mechanochemical and sintered solid state reactions: A comparative study

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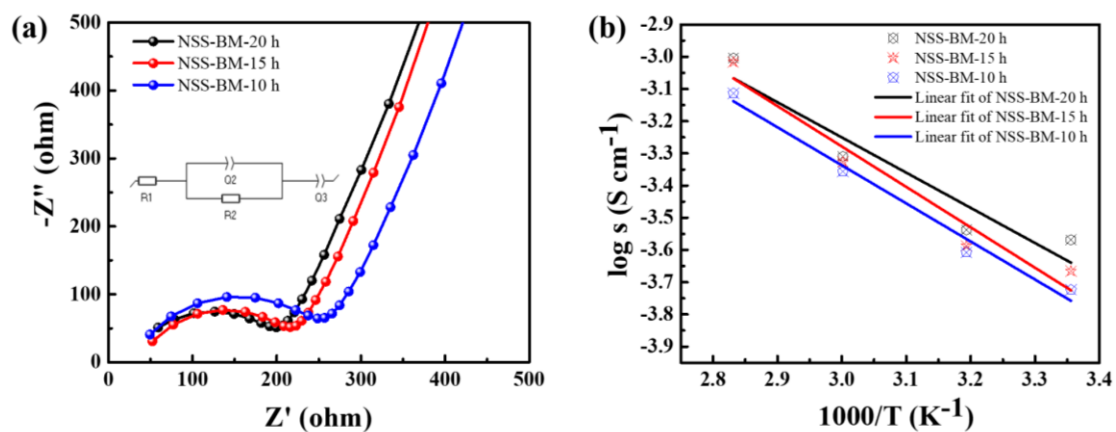


Figure S1. (a) Nyquist impedance plots at RT, Inset: Equivalent circuit in the system and (b) Arrhenius plots at 25, 40, 60, 80 °C of NSS-BM10 h, 15 h, 20 h.

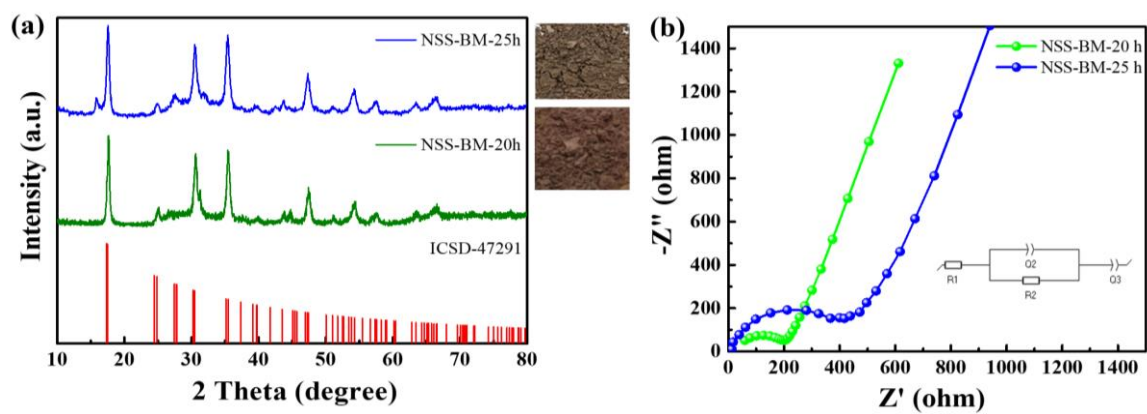


Figure S2. (a) X-ray diffraction patterns of only ball milling (BM) with respective sample photos and (b) Nyquist impedance plots of Na₃SbS₄ –BM -20 h and 25 h at RT, Inset: Equivalent circuit in the system.

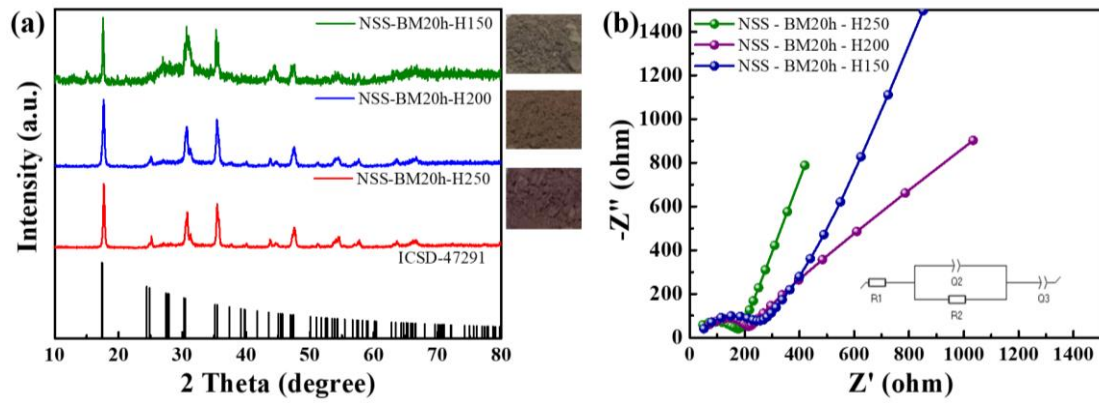


Figure S3. (a) X-ray diffraction patterns of BM and then sintering Na_3SbS_4 (BM-H) with respective sample photos and (b) Nyquist impedance plots at RT, Inset: Equivalent circuit in the system of NSS-BM20h-H250, H200, H150 °C.

Table S1. Comparison of ionic conductivity and activation energy of Na₃SbS₄ with only BM samples from first method.

Samples	L (cm)	S (cm ²)	R _b (Ω)	R _{gb} (Ω)	R _b +R _{gb} (Ω)	σ _{25 °C} (S cm ⁻¹)	E _a (eV)
NSS-BM-10h	0.044	0.7854	48	248	296	1.89×10 ⁻⁴	0.24
NSS-BM-15h	0.044	0.7854	45.9	213.9	253.9	2.16×10 ⁻⁴	0.23
NSS-BM-20h	0.044	0.7854	31	171.4	202.4	2.77×10 ⁻⁴	0.22

Table S2. Comparison of ionic conductivity of Na₃SbS₄ with only BM from first method.

Samples	L (cm)	S (cm ²)	R _b (Ω)	R _{gb} (Ω)	R _b +R _{gb} (Ω)	σ ^{25 °C} (S cm ⁻¹)
NSS-BM20h-H150	0.044	0.7854	49.04	205.6	254.6	2.20×10 ⁻⁴
NSS-BM20h-H200	0.043	0.7854	43.81	148.8	192.6	2.26×10 ⁻⁴
NSS-BM20h-H250	0.043	0.7854	11.43	164.7	176.13	3.11×10 ⁻⁴

