Supplementary Materials

A large enhancement of ionic conductivity in $SrCoO_{2.5}$ controlled by isostructural phase transition and negative linear compressibility

Bihan Wang[1, #], Nana Li[1, #,*], Yongsheng Zhao[1], Xuqiang Liu[1], Mingtao Li[1], Qian Zhang[1, 2], Haini Dong[1], Yu He[3], Dongzhou Zhang[4], Yonggang Wang[1], Gang Liu[1], Youwen Long[5], and Wenge Yang[1, *]

[1]Center for High Pressure Science and Technology Advanced Research (HPSTAR), Shanghai 201203, P. R. China

[2]College of Material and Chemical Engineering, Zhongyuan University of Technology, Zhengzhou 450007, P. R. China

[3]Key Laboratory of High-Temperature and High-Pressure Study of the Earth's Interion, Institute of Geochemistry, Chinese Academy of Sciences, Guiyang 550081, P. R. China

[4]Hawaii Institute of Geophysics & Planetology, University of Hawaii Manoa, Honolulu, Hawaii 96822, United States

[5]Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing 100190, P. R. China

[#]These authors contribute equally to this work.
*Correspondence and requests for materials should be addressed to nana.li@hpstar.ac.cn (N. Li) and yangwg@hpstar.ac.cn (W. Yang)

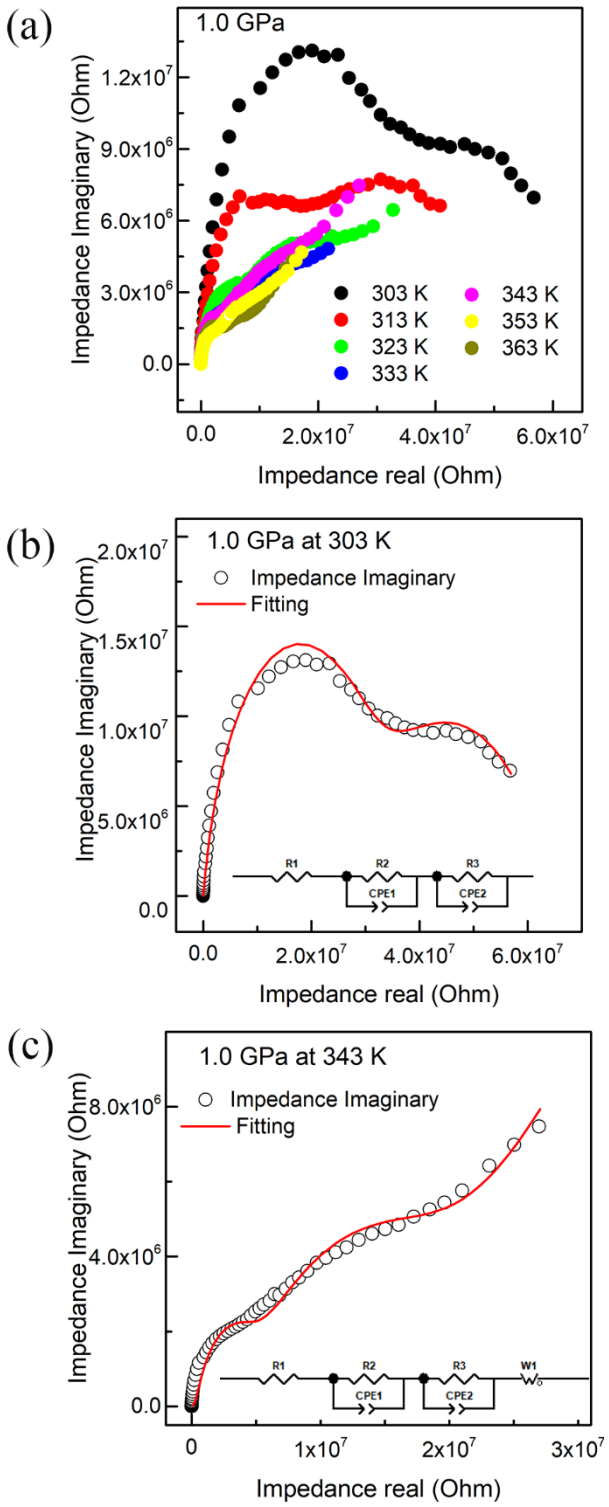

Figure S1. (a) AC impedance spectrum of $SrCoO_{2.5}$ at different temperatures at 1.0 GPa. The fitting of the experimental AC impedance data of $SrCoO_{2.5}$ measured at 1.0 GPa and 303 K (b) and 343 K (c). The fitting equivalent circuit consists the resistor (R), constant phase element (CPE), and the Warburg element (W)[33, 34].

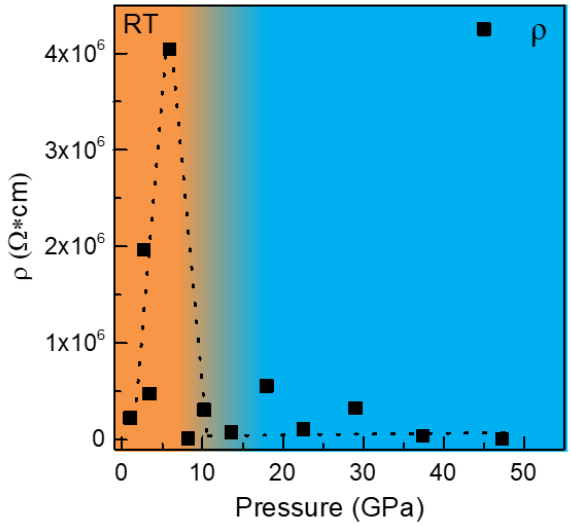

Figure S2. The resistivity of $SrCoO_{2.5}$ at high pressure and room temperature, obtained by AC impedance measurements.

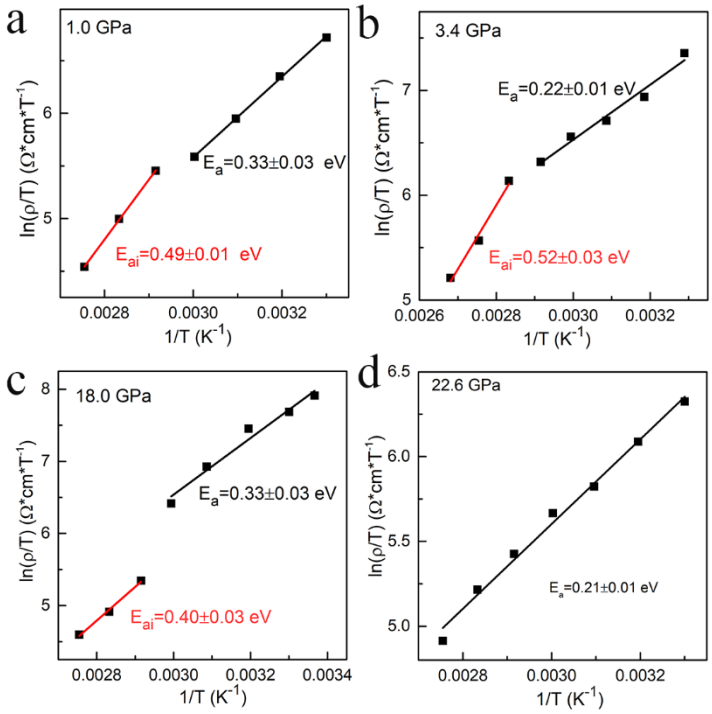

Figure S3. The ln(ρ/T) versus 1/T plots and corresponding ionic activation energy E_{ai} (high temperature region) and mixture activation energy E_a (low temperature region) fittings of $SrCoO_{2.5}$ at 1.0 GPa (a), 3.4 GPa (b), 18.0 GPa (c), and 22.6 GPa (d). The fittings were performed with Arrhenius equation from ln(ρ/T) versus 1/T curves at different pressures.