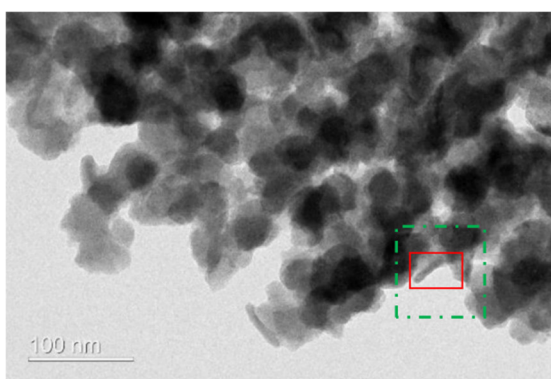
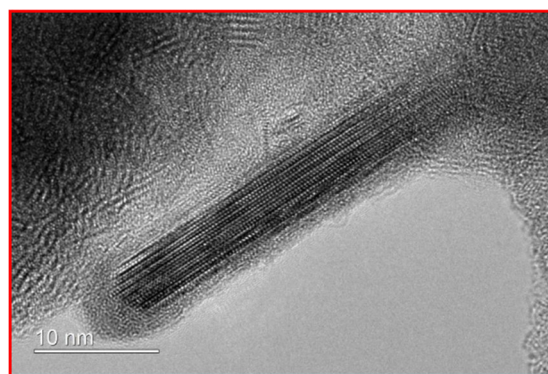


(a)

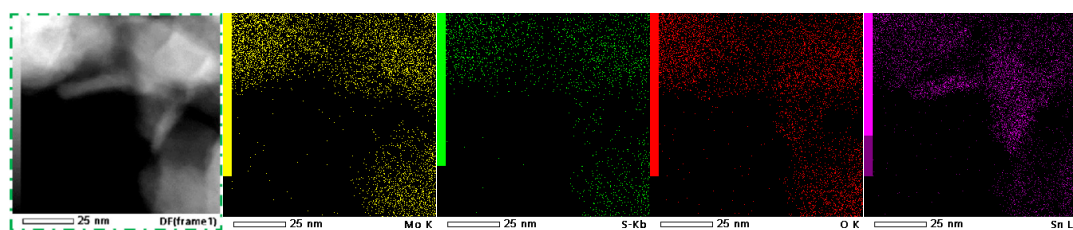
Figure S1. GIXRD pattern of FTO substrate sulfurized at different temperatures, $w = 0.8$.



(a)



(b)



(c)

Figure S2. HRTEM observation of MI-400 powder scratched from thin film; the same observation area is marked in the figure (a) HRTEM image of MI-400 with the scale bar at 100 nm; (b) scale bar at 10 nm; (c) Element mapping from HRTEM equipped with EDX device with the scale bar at 25 nm.

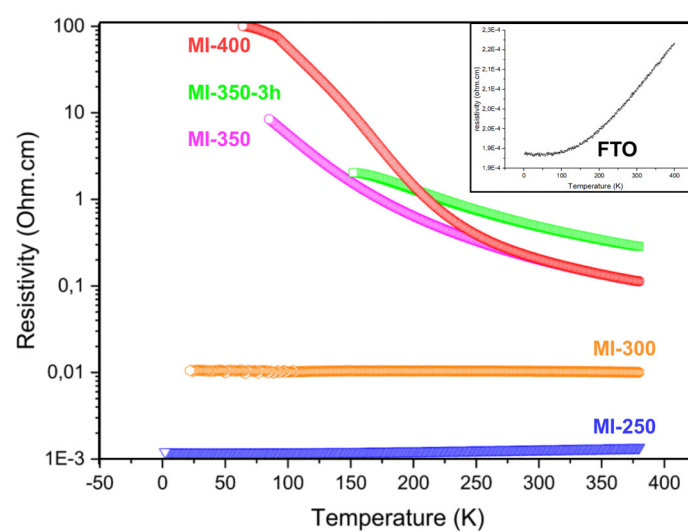


Figure S3. Electrical measurements of the sulfurized samples at different temperatures, with a blank FTO substrate inserted at the top right as a reference.