Supplementary information

Figure S1: Signal stability of various elements/isotopes upon analysis of indium pressed 57b silicon powder at a discharge condition of 2 mA and 1 kV using argon flow rate of 0.50 ml/min.....2

Figure S2: Relation between argon flow rate and current at various voltages upon analysing indium pressed 57b silicon powder.....2

Figure S3: Variation in absolute intensities of various elements/isotopes, silicon (A), boron (B), phosphorous (C), cobalt (D), aluminium (E), iron (F), chromium (G), and copper (H) upon analysing indium pressed 57b silicon powder with discharge condition in range of 1 – 3.5 mA and 1 – 1.4 kV.....3

Figure S4: Variation in quantification of oxygen (A) and argon (B) upon analysing upgrade metallurgical grade flat silicon sample at discharge condition in range of 0.5 – 5 mA and 1.2 – 1.6 kV, plotted using standard RSF.....4

Figure S5: Crater profile of flat silicon sample after sputtering for 2.5 h at discharge condition of 2.3 mA, 0.7 kV using argon flow of 0.4 ml/min.....4

Table S1: Summary of average and uncertainty associated with various elements based on NIST certificates and after ICP-MS analysis.....4

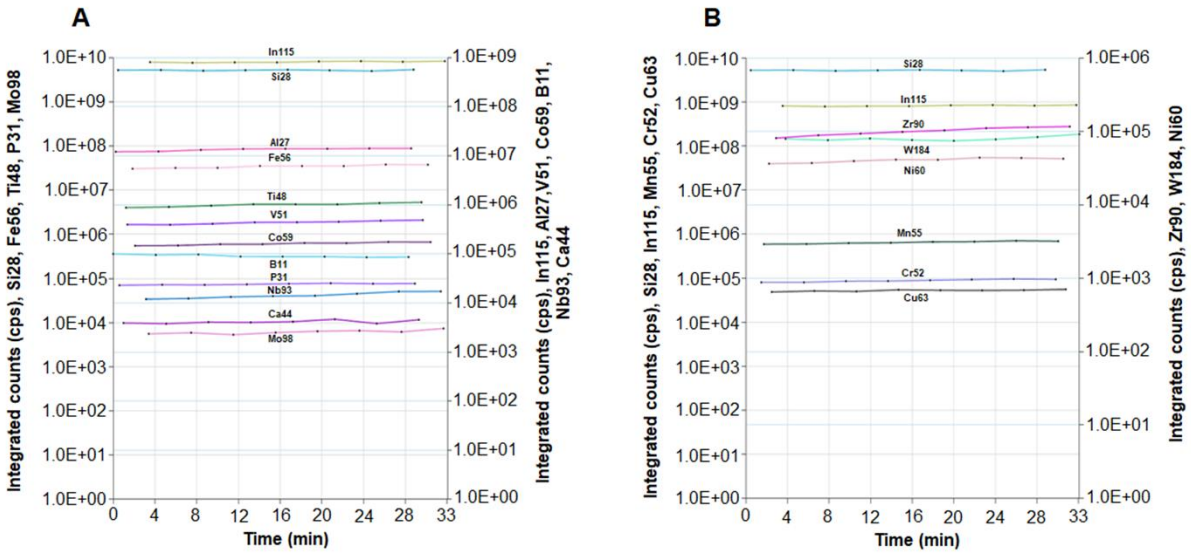

Figure S1: Signal stability of various elements/isotopes upon analysis of indium pressed 57b silicon powder at a discharge condition of 2 mA and 1 kV using argon flow rate of 0.50 ml/min.

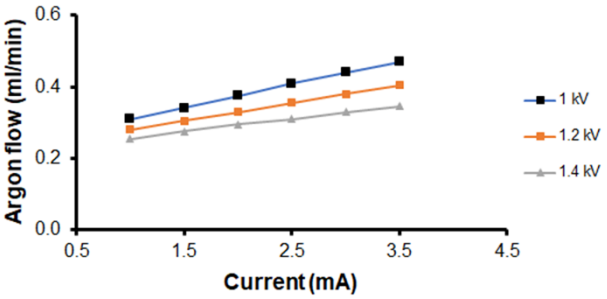

Figure S2: Relation between argon flow rate and current at various voltages upon analysing indium pressed 57b silicon powder.

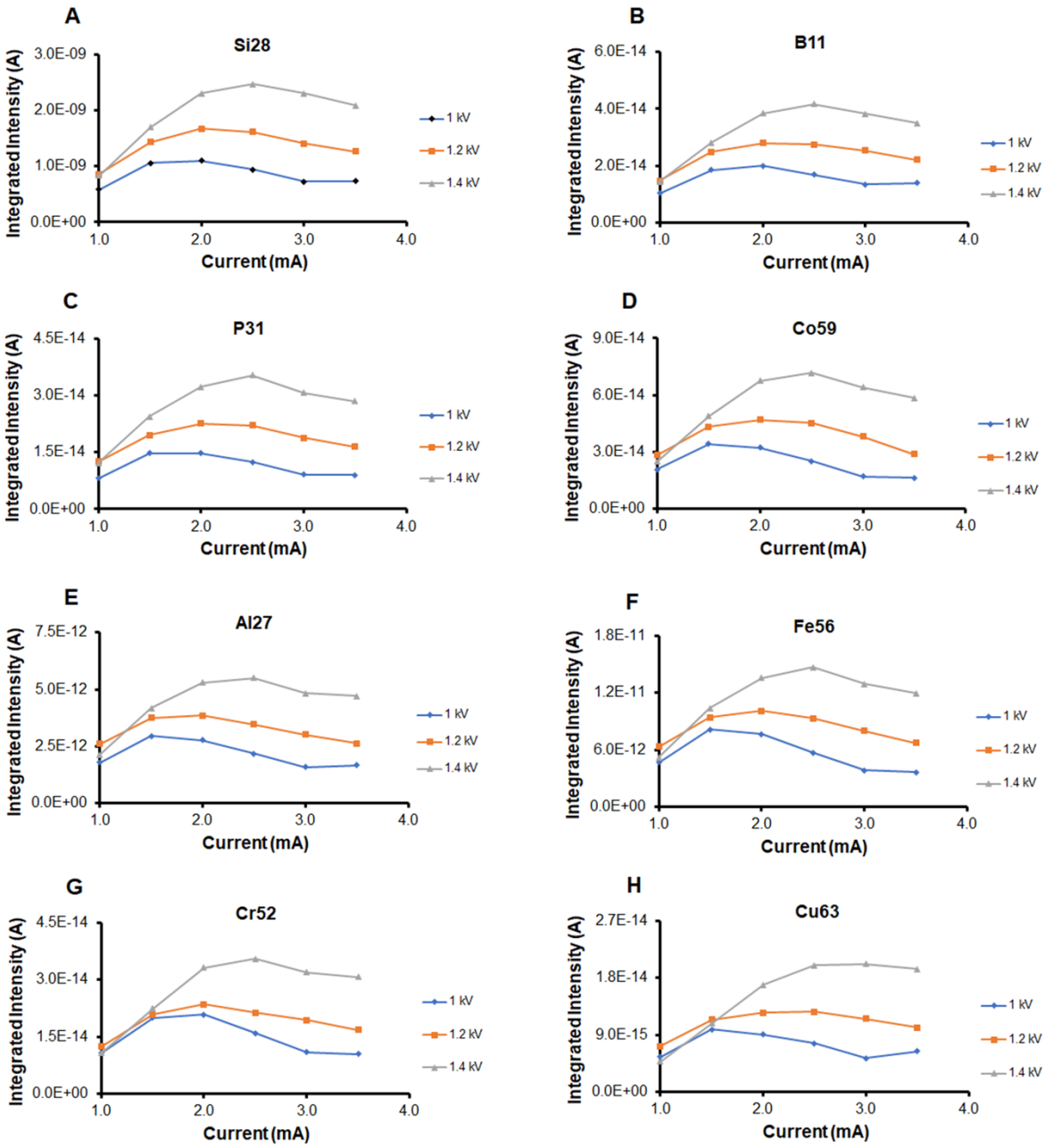

Figure S3: Variation in absolute intensities of various elements/isotopes, silicon (A), boron (B), phosphorous (C), cobalt (D), aluminium (E), iron (F), chromium (G), and copper (H) upon analysing indium pressed 57b silicon powder with discharge condition in range of 1 – 3.5 mA and 1 – 1.4 kV.

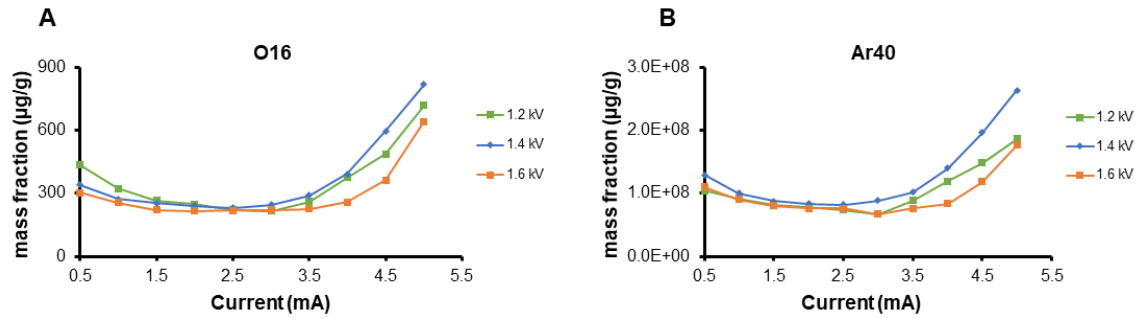

Figure S4: Variation in quantification of oxygen (A) and argon (B) upon analysing a flat silicon sample at discharge condition in range of 0.5 – 5 mA and 1.2 – 1.6 kV, plotted using standard RSF.

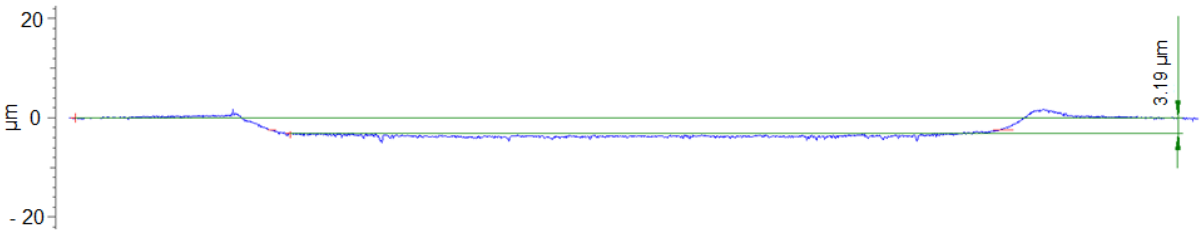

Figure S5: Crater profile of a flat silicon sample after sputtering for 2.5 h at discharge condition of 2.3 mA, 0.7 kV using argon flow of 0.4 ml/min.

Table S1: Summary of average and uncertainty associated with various elements based on NIST certificates and after ICP-MS analysis.

	Values from Certificates (µg/g)		ICP-MS reference values (µg/g)	
	NIST 57b silicon powder	NIST 195 ferrosilicon powder	NIST 57b silicon powder	NIST 195 ferrosilicon powder
Boron	12.5 ± 17%*	10.5 ± 15%	13.1 ± 11%	9.4 ± 4%
Aluminium	1690 ± 13%	460.0 ± 20%*	1548.9 ± 6%	434.3 ± 3%
Phosphorous	16.3 ± 9%	190.0 ± 46%*	14.3 ± 5%	139.0 ± 2%
Calcium	22.2 ± 20%*	540.0 ± 35%*	7.7 ± 19%	387.7 ± 8%
Titanium	346 ± 14%	367.0 ± 10%*	302.8 ± 4%	322.2 ± 4%
Vanadium	25**	-	23.7 ± 4%	19.6 ± 3%
Chromium	17.3 ± 19%*	474.0 ± 8%	15.9 ± 4%	378.9 ± 2%
Manganese	78.2 ± 9%	1710.0 ± 3%	70 ± 4%	1398.8 ± 4%
Iron	3400 ± 2%	236200.0 ± 1%	3160.3 ± 6%	204555.2 ± 2%
Cobalt	14**	-	11.9 ± 5%	24.7 ± 1%
Nickel	15.3 ± 11%	318.0 ± 6%	16.3 ± 3%	266.3 ± 2%
Copper	17.2 ± 34%*	468.0 ± 5%	21.5 ± 4%	387.9 ± 2%
Zirconium	17.8 ± 3%	110.0 ± 60%*	19.2 ± 8%	110.6 ± 7%
Niobium	-	-	1.3 ± 6%	2.8 ± 4%
Molybdenum	-	-	2.8 ± 13%	72.3 ± 1%
Tungsten	-	-	39.3 ± 8%	13.9 ± 4%

*, ** and no asterisk sign represent reference, information, and certified values respectively as reported on NIST certificates of silicon 57b and ferrosilicon 195. Percentage values represent RSD calculated from average and uncertainty as shown in Table 1 and Table 2.