

## Supporting information

### **Rationally reconstructing the surface microstructure of chemical bath deposited electron transport layer for efficient and stable perovskite solar cells**

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## Experimental Section

### 1. Materials:

Fluorine-doped tin oxide glass (FTO) glass substrate, isopropanol (IPA), N, N-dimethylformamide (DMF), dimethyl sulfoxide (DMSO) and Acetonitrile (ACN) were purchased from Advanced electron technology CO., Ltd (China). Methylammonium chloride (MACl), Formamidinium iodide (FAI), Methylammonium bromide (MABr), Cesium (CsI), lead bromide (PbBr<sub>2</sub>), lead iodide (PbI<sub>2</sub>), 4-t-butylphenylammonium iodide (tBP), spiro-OMeTAD, lithium bis (trifluoromethanesulfonyl) imide (Li-TFSI) and FK209 Co(III)-TFSI salt were purchased from Xi'an Yuri Solar Co., Ltd (China). Chlorobenzene (CB), thioglycolic acid (TGA), Titanium tetrachloride (TiCl<sub>4</sub>) and Stannous chloride dihydrate (SnCl<sub>2</sub>·2H<sub>2</sub>O) were purchased from InnoChem (China). Tin (IV) oxide (15% in H<sub>2</sub>O colloidal dispersion) were purchased from Alfa Aesar. Absolute ethyl alcohol and urea were purchased from Sinopharm.

### 2. Synthesis of CBD-SnO<sub>2</sub> ETL

The CBD solution was prepared by dissolving 1 g urea and 220 mg SnCl<sub>2</sub>·2H<sub>2</sub>O in 80 ml DI water, followed by the addition of 20 µl thioglycolic acid and 1 ml HCl (37 wt%). The etched FTO substrates were ultrasonically washed for 20 min. Afterwards, all substrates were dried in an oven at 60° for 2 h. The deposition was made by putting the substrates vertically in a designed beaker filled with the above solution, in a 90 °C laboratory water bath for 4 h. The substrate needs to cool to RT before being cleaned with DI water and IPA for 5 minutes each to remove solvents effectively. The sample is annealed at 150°C for 1 h. Different concentrations of H<sub>2</sub>SO<sub>4</sub> solution were spin-coated on CBD-SnO<sub>2</sub> at 3000 rpm for half a minute. The samples were then annealed at 150°C for a quarter.

### 3. Synthesis of FAPbI<sub>3</sub> powder

Formamidinium lead triiodide (FAPbI<sub>3</sub>) black powder was synthesized by mixing 3.36 g FAI with 9 g PbI<sub>2</sub> (1:1 molar ratio) in 11 ml of 2-ME in a 70-ml vial by stirring. The mixed solution was heated to 120 °C in an oil bath and stirred for 45 min. Subsequently, the precipitated FAPbI<sub>3</sub> was filtered using filter paper without cooling to RT. The filtered FAPbI<sub>3</sub> was baked on a hot plate at 150 °C (in air) for 30 min and then left overnight in a vacuum chamber at RT.

#### 4. Device fabrication:

PSCs were composed of several layers of glass/FTO/CBD-SnO<sub>2</sub>/perovskite/Spiro-OMeTAD/Ag. The FTO substrate with CBD-SnO<sub>2</sub> was cleaned with UV-ozone for 15 minutes to remove impurities and improve wettability before use. The perovskite precursor solutions were prepared by dissolving 1.6 M FAPbI<sub>3</sub> powder with MDACl<sub>2</sub> (3.8 mol%) and MACl (35 mol%) in a mixed solvent of DMF: DMSO = 8:2. The perovskite solutions were then spin-coated onto the substrate at 1000 rpm for 10s and 5000 rpm for 15 s; 100 µl of CB ether was dripped onto the substrate during spinning. The substrates were cooled down to RT after annealing the perovskite. The hole-transporting material was deposited via spin coating at 4000 rpm for 30 s. The solution, composed of 72.3 mg spiro-OMeTAD, 30 µl TBP, 35 µl Li-TFSI (260 mg Li-TFSI dissolved in 1 ml ACN), and 10 µl FK209 (300 mg FK209 dissolved in 1 ml ACN) in 1 ml CB, was prepared as the hole-transporting solution. Finally, 100 nm of Ag top electrode was deposited through thermal evaporator under high vacuum with an active area of 0.09 cm<sup>2</sup>.

#### 5. Synthesis of CBD-TiO<sub>2</sub> ETL

Slowly drip 2 ml of TiCl<sub>4</sub> solution into 200 ml of DI water, and stir well. Then soak the cleaned FTO in the TiCl<sub>4</sub> solution and keep it at 70°C for 40 minutes.

#### 6. Property Characterization

The optical properties of the films were analyzed using a UV-Vis-near-infrared (NIR) spectrophotometer (Shimadzu, UV-3600Plus, Japan). Fourier transform infrared spectroscopy (FTIR) measurements were made using Nicolet iS10, America. X-ray photoelectron spectroscopy (XPS) was used to obtain the chemical states information (measured by Thermo Scientific Escalab250Xi, Germany). And we utilized this system to obtain Ultraviolet photoelectric emission spectroscopy (UPS) under ultra-high vacuum pressure. The crystal structure of perovskite samples were carried out by X-ray diffraction (XRD) (PANalytical X-ray Spectrometer Empyrean DY01660 ID206161). The scanning electron microscope (SEM) images was taken using a Hitachi S-4800. AFM was measured by Park NX20, Korea. PL spectra were obtained using a PL microscopic spectrometer (FLS1000, China) with a 405 nm CW laser excitation source. The TRPL (FLS1000, China) was measured by using an excitation wavelength of 405nm. The current density-voltage characteristics (J-V) of the devices were measured under a simulated AM 1.5G solar irradiation at 100 mW/cm<sup>2</sup> in air using a 94043A I-V Station (Newport Oriel, American). The external quantum efficiency (EQE) spectra of the devices were recorded in air without bias light by using a Newport Oriel IQE200, American. Electrical impedance spectroscopy (EIS) was performed by using the electrochemical workstation (CHI660C, Chen Hua, China) with a frequency range from 1 Hz to 0.1 MHz in the dark.

## Supplementary Notes S1

### The details for SCLC analyses

The electrical conductivity ( $\sigma$ ) of various ETLs calculated by the equation of

$$I = \sigma AL^{-1}V$$

where  $A$  is the area and  $L$  is the thickness of the film.

The  $J^{1/2}$ - $V$  curves are used to estimate the electron mobility according to the equation<sup>1-4</sup>

$$J = 9\varepsilon_0\varepsilon_r\mu V^2/8L^3$$

where  $\varepsilon_r$  is the relative permittivity,  $\varepsilon_0$  is the vacuum permittivity,  $\mu$  is the carrier mobility, and  $L$  is the thickness.

Here, the value of  $\varepsilon_r$  is 3.85 and the value of  $L$  is 30 nm.

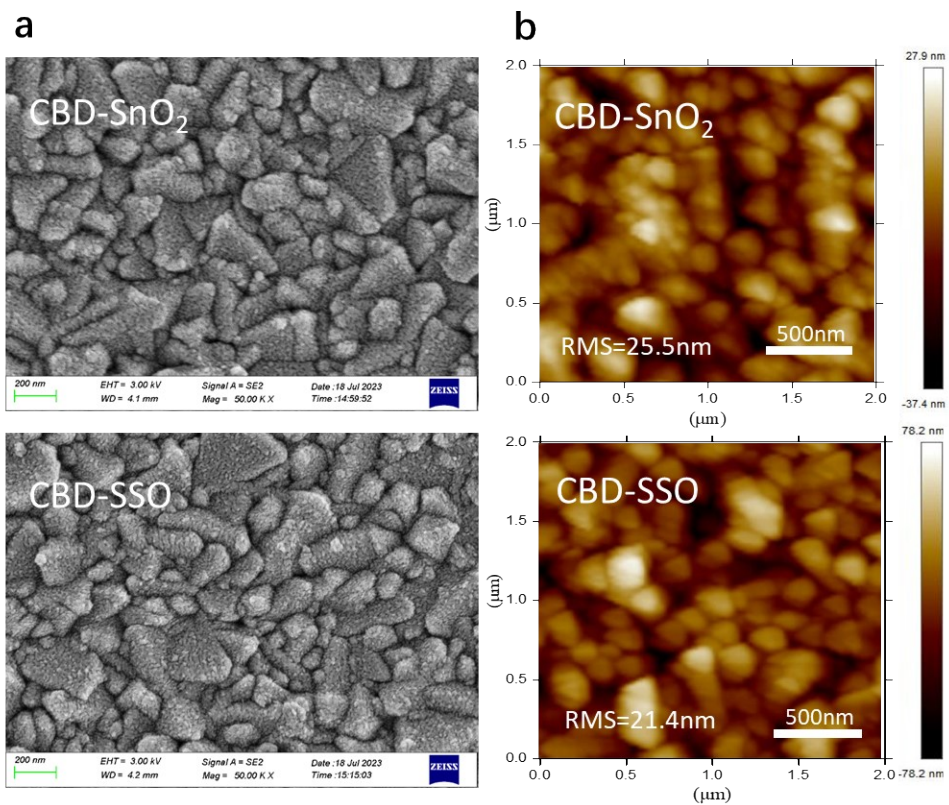
## Supplementary Notes S2

DFT calculations were conducted through the Vienna ab initio Simulation Package (VASP) with the projector augmented wave method<sup>5,6</sup>. Generalized gradient approximation of the Perdew-Burke-Ernzerhof (PBE) functional was used as the exchange-correlation functional<sup>7</sup>. The Brillouin zone was sampled with  $2 \times 2 \times 1$  K points for surface calculation<sup>8</sup>. The cutoff energy was set as 500 eV, and structure relaxation was performed until the convergence criteria of energy and force reached  $1 \times 10^{-5}$  eV and  $0.02 \text{ eV \AA}^{-1}$ , respectively. A vacuum layer of 15 Å was constructed to eliminate interactions between periodic structures of surface models. The van der Waals (vdW) interaction was amended by the zero damping DFT-D3 method of Grimme<sup>9</sup>.

The adsorption energy ( $\Delta E_{\text{ads}}$ ) of adsorbate adsorption on surface is defined as

$$\Delta E_{\text{ads}} = E(*\text{adsorbate}) - E(*) - E(\text{adsorbate})$$

where  $E(*\text{adsorbate})$  and  $E(*)$  are the total energy of surface systems with and without adsorbate, respectively,  $E(\text{adsorbate})$  is the energy of an isolated adsorbate. According to this definition, negative adsorption energy suggests that the adsorption process is exothermic and the adsorption system is thermodynamically stable. Contrarily, a positive value corresponds to an endothermic and unstable adsorption.



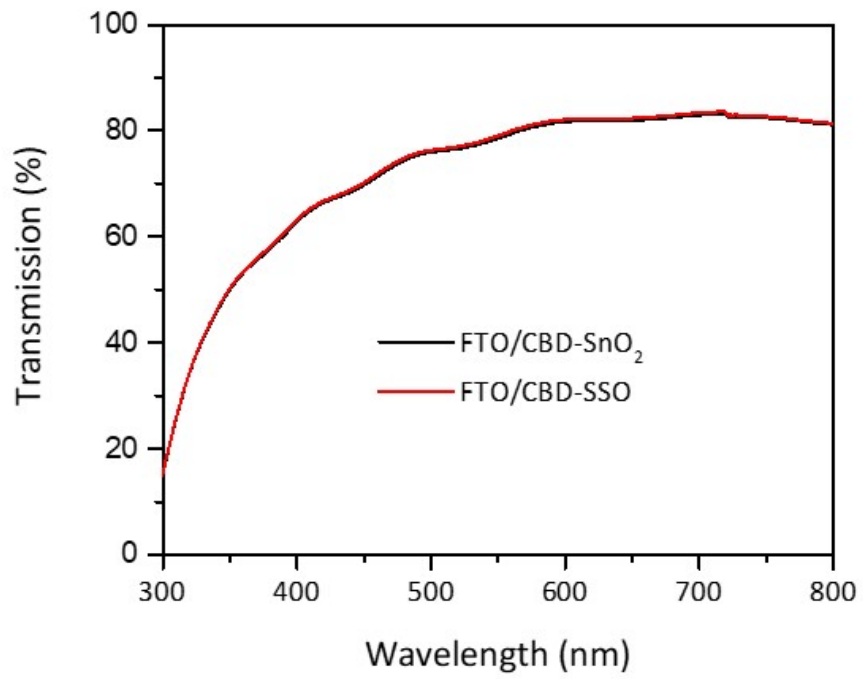


Figure S2. Optical transmission spectra of the CBD-SnO<sub>2</sub> and CBD-SSO films.



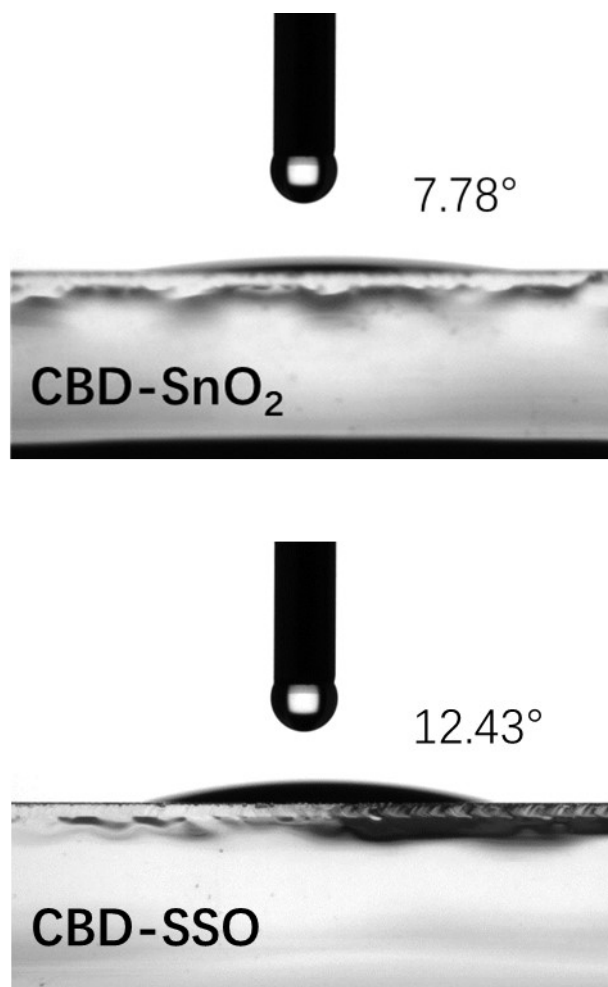


Figure S3. The surface of CBD-SnO<sub>2</sub> and CBD-SSO water contact Angle.

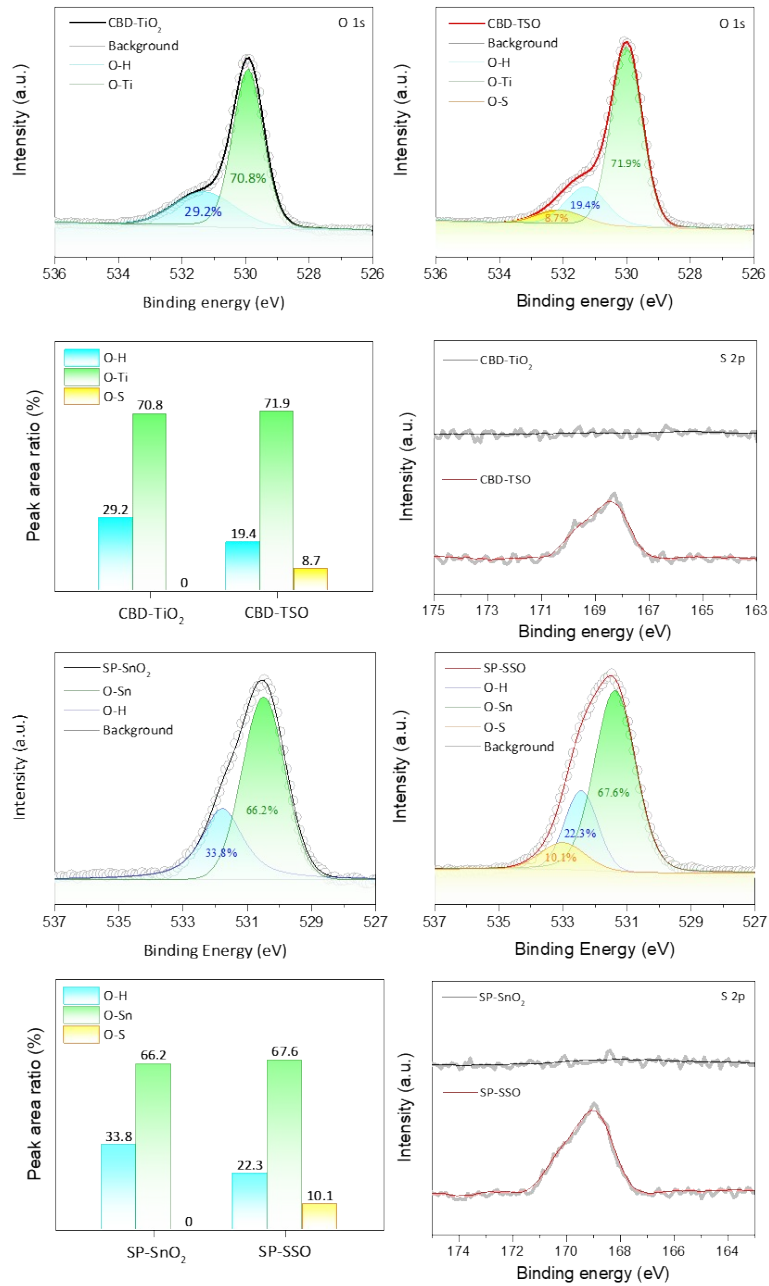


Figure S4. XPS O 1s, S 2p of titanium oxide prepared via CBD method (CBD-TiO<sub>2</sub>) and SnO<sub>2</sub> prepared through spin coating method (SP-SnO<sub>2</sub>) before and after H<sub>2</sub>SO<sub>4</sub> treatment (CBD-TSO and SP-SSO), respectively.

After H<sub>2</sub>SO<sub>4</sub> modification, the appearance of a S peak was observed, which proved the successful introduction of SO<sub>4</sub><sup>2-</sup>. At the same time, there was a varying degree of decrease in the peak area occupied by -OH, indicating that SO<sub>4</sub><sup>2-</sup> have a good removal effect on -OH on the surface of MO<sub>x</sub>.

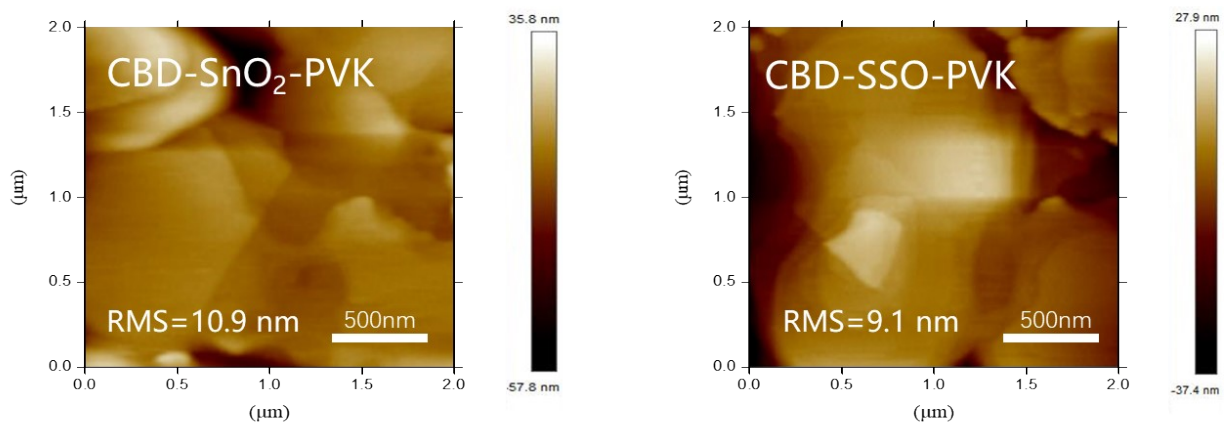


Figure S5. AFM images of the perovskite films deposited on CBD-SnO<sub>2</sub> and CBD-SSO.

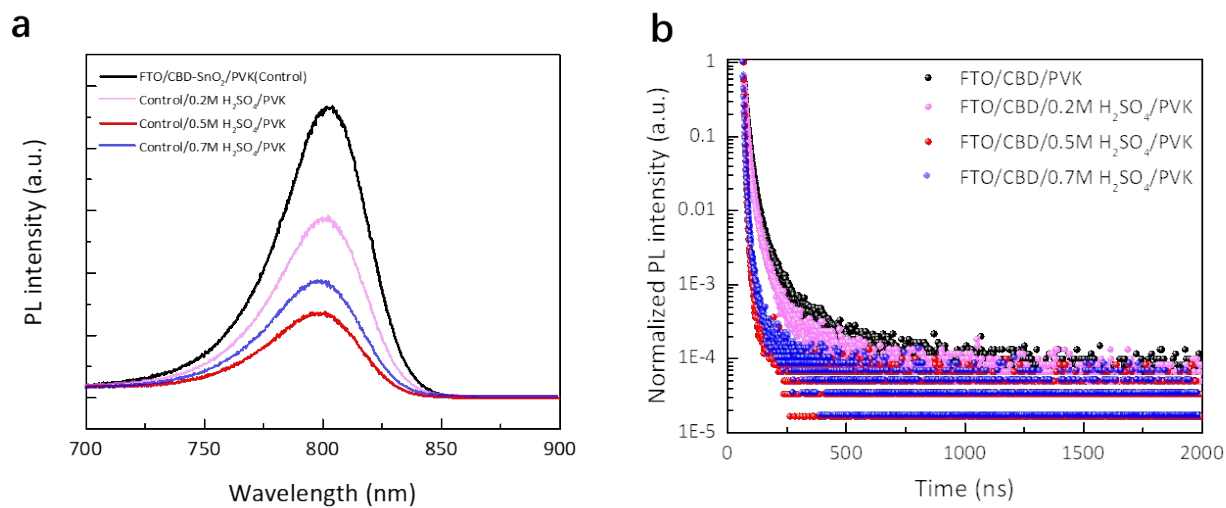


Figure S6. PL spectra and time-resolved PL (TRPL) of CBD-SnO<sub>2</sub>-PVK and CBD-SSO-PVK, respectively.

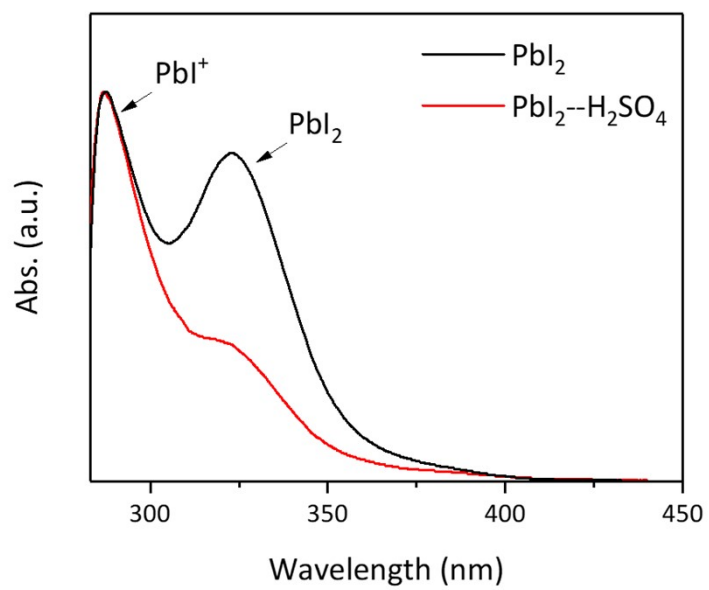


Figure S7 UV-vis absorption spectra of  $\text{PbI}_2$  and  $\text{PbI}_2\text{--H}_2\text{SO}_4$  mixture.

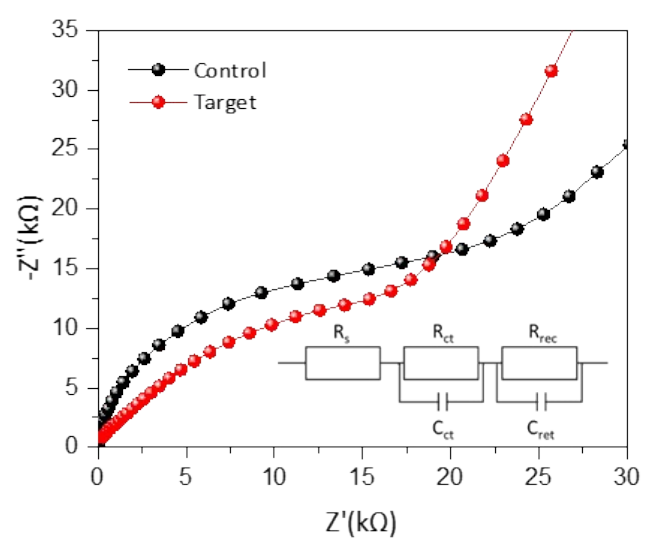


Figure S8 Nyquist plots for the control and target device.

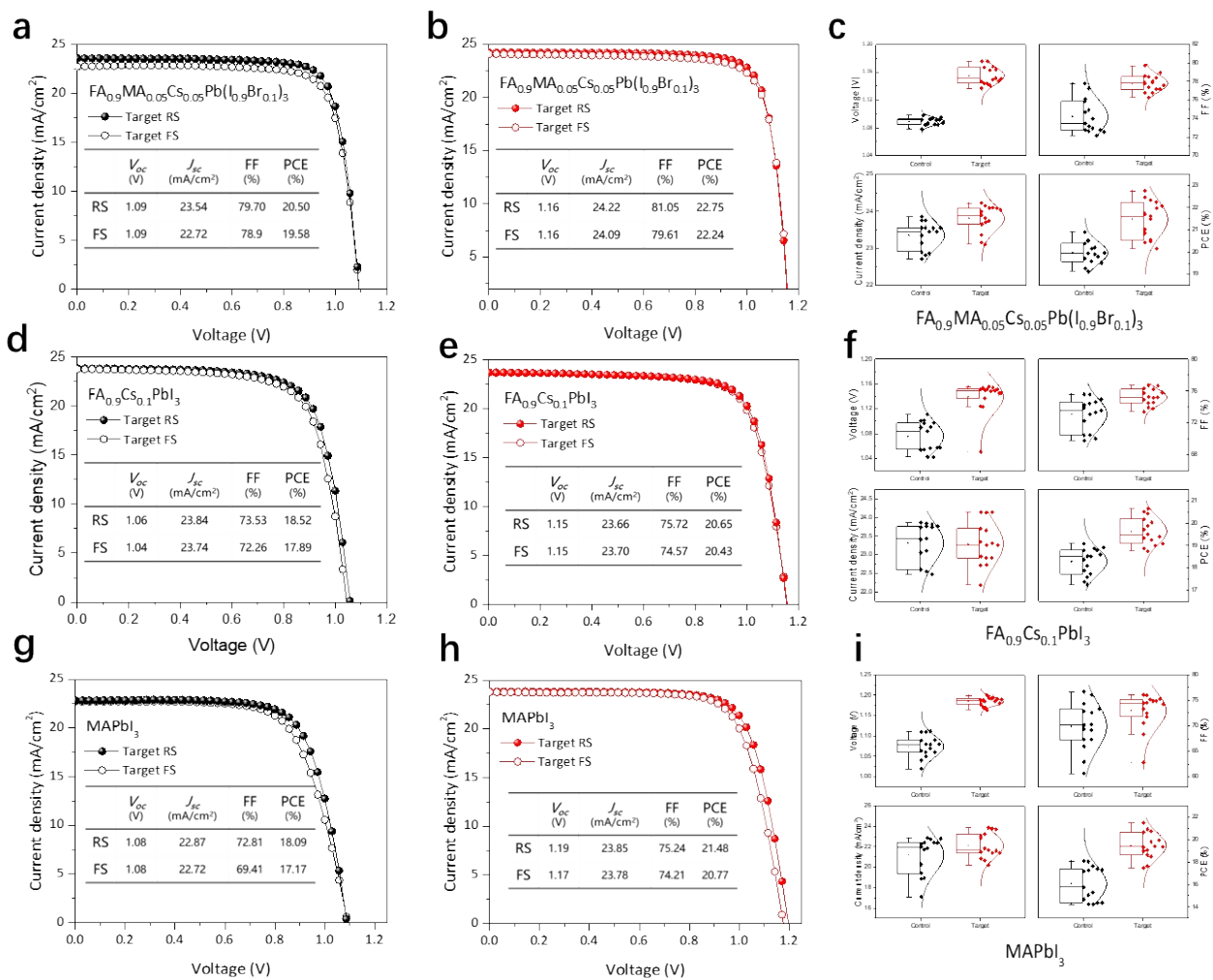


Figure S9 The champion devices of different composition perovskite prepared on CBD-SnO<sub>2</sub> (a, d, g) and CBD-SSO (b, e, h) substrates. The forward and reverse scan I-V curves were measured, with statistical graphs of 15 device parameters plotted (c, f, i).

Table S1 Fitting parameters of the bi-exponential decay function in TRPL of the corresponding CBD-SnO<sub>2</sub>-PVK and CBD-SSO-PVK substrate using a 460 nm excitation light source.

<b>Sample</b>	<b><math>\tau_1</math> (ns)</b>	<b><math>A_1</math> (%)</b>	<b><math>\tau_2</math> (ns)</b>	<b><math>A_2</math> (%)</b>	<b><math>\tau_{\text{avg}}</math> (ns)</b>
Control	5.29	72.73	18.14	27.27	12.52
0.2M H <sub>2</sub> SO <sub>4</sub>	4.57	66.49	18.26	33.51	13.72
0.5M H <sub>2</sub> SO <sub>4</sub>	2.60	82.51	10.21	17.49	6.06
0.7M H <sub>2</sub> SO <sub>4</sub>	3.60	76.11	13.55	23.89	8.99



## References

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### The absorption of the CBD-SnO<sub>2</sub> and CBD-SSO

200	0.031	0.084
200.5	0.031	0.084
201	0.031	0.084
201.5	0.032	0.085
202	0.032	0.085
202.5	0.032	0.085
203	0.032	0.085
203.5	0.032	0.085
204	0.031	0.086
204.5	0.031	0.086
205	0.031	0.086
205.5	0.031	0.087
206	0.031	0.087
206.5	0.032	0.088
207	0.032	0.088
207.5	0.032	0.088
208	0.032	0.088
208.5	0.032	0.088
209	0.031	0.088
209.5	0.031	0.088
210	0.032	0.088
210.5	0.031	0.088
211	0.031	0.088
211.5	0.031	0.088
212	0.031	0.089
212.5	0.031	0.089
213	0.031	0.089
213.5	0.032	0.089
214	0.032	0.089
214.5	0.032	0.089
215	0.032	0.089
215.5	0.032	0.089
216	0.032	0.089
216.5	0.031	0.089
217	0.031	0.089
217.5	0.031	0.089
218	0.031	0.089
218.5	0.031	0.089
219	0.03	0.089
219.5	0.03	0.089
220	0.031	0.089
220.5	0.03	0.089

221	0.031	0.089
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222	0.031	0.09
222.5	0.031	0.089
223	0.031	0.089
223.5	0.03	0.09
224	0.03	0.09
224.5	0.031	0.09
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258.5	0.033	0.085
259	0.033	0.086
259.5	0.034	0.086
260	0.034	0.087
260.5	0.035	0.087
261	0.036	0.088
261.5	0.037	0.089
262	0.038	0.09
262.5	0.039	0.091
263	0.041	0.093
263.5	0.043	0.095
264	0.045	0.097
264.5	0.048	0.1

265	0.051	0.103
265.5	0.054	0.106
266	0.058	0.11
266.5	0.063	0.115
267	0.069	0.121
267.5	0.075	0.128
268	0.083	0.136
268.5	0.091	0.145
269	0.101	0.155
269.5	0.113	0.168
270	0.127	0.182
270.5	0.142	0.198
271	0.159	0.216
271.5	0.179	0.237
272	0.202	0.261
272.5	0.228	0.288
273	0.258	0.319
273.5	0.291	0.353
274	0.329	0.392
274.5	0.371	0.435
275	0.418	0.485
275.5	0.471	0.54
276	0.53	0.601
276.5	0.595	0.67
277	0.668	0.746
277.5	0.747	0.828
278	0.834	0.918
278.5	0.927	1.016
279	1.03	1.123
279.5	1.142	1.239
280	1.263	1.366
280.5	1.394	1.501
281	1.533	1.646
281.5	1.683	1.802
282	1.844	1.969
282.5	2.016	2.146
283	2.199	2.336
283.5	2.394	2.538
284	2.596	2.746
284.5	2.809	2.965
285	3.031	3.195
285.5	3.263	3.436
286	3.509	3.688
286.5	3.767	3.956

287	4.035	4.236
287.5	4.313	4.527
288	4.6	4.825
288.5	4.896	5.138
289	5.202	5.462
289.5	5.526	5.804
290	5.864	6.162
290.5	6.217	6.535
291	6.579	6.92
291.5	6.949	7.31
292	7.328	7.704
292.5	7.712	8.106
293	8.112	8.522
293.5	8.526	8.95
294	8.956	9.394
294.5	9.391	9.848
295	9.837	10.311
295.5	10.286	10.778
296	10.745	11.253
296.5	11.211	11.737
297	11.689	12.234
297.5	12.177	12.741
298	12.666	13.251
298.5	13.159	13.768
299	13.654	14.288
299.5	14.166	14.824
300	14.678	15.361
300.5	15.192	15.902
301	15.712	16.442
301.5	16.24	16.987
302	16.757	17.518
302.5	17.275	18.047
303	17.803	18.582
303.5	18.334	19.119
304	18.862	19.653
304.5	19.392	20.182
305	19.921	20.715
305.5	20.45	21.24
306	20.972	21.765
306.5	21.487	22.291
307	22.001	22.819
307.5	22.514	23.349
308	23.012	23.873
308.5	23.509	24.393

309	24.002	24.9
309.5	24.458	25.373
310	24.903	25.829
310.5	25.351	26.284
311	25.791	26.731
311.5	26.22	27.17
312	26.68	27.634
312.5	27.135	28.097
313	27.592	28.563
313.5	28.043	29.022
314	28.496	29.487
314.5	28.929	29.94
315	29.36	30.398
315.5	29.775	30.841
316	30.185	31.28
316.5	30.584	31.705
317	30.985	32.128
317.5	31.373	32.533
318	31.762	32.933
318.5	32.142	33.325
319	32.509	33.711
319.5	32.872	34.087
320	33.234	34.455
320.5	33.579	34.807
321	33.927	35.158
321.5	34.271	35.501
322	34.612	35.845
322.5	34.951	36.187
323	35.285	36.532
323.5	35.607	36.863
324	35.929	37.195
324.5	36.238	37.512
325	36.545	37.829
325.5	36.85	38.14
326	37.155	38.454
326.5	37.462	38.758
327	37.771	39.062
327.5	38.075	39.354
328	38.375	39.645
328.5	38.668	39.922
329	38.959	40.199
329.5	39.246	40.475
330	39.526	40.747
330.5	39.81	41.017

331	40.089	41.292
331.5	40.36	41.555
332	40.631	41.829
332.5	40.901	42.093
333	41.165	42.35
333.5	41.435	42.612
334	41.7	42.872
334.5	41.956	43.117
335	42.207	43.359
335.5	42.455	43.601
336	42.691	43.829
336.5	42.934	44.058
337	43.19	44.299
337.5	43.442	44.54
338	43.692	44.78
338.5	43.948	45.024
339	44.198	45.269
339.5	44.422	45.495
340	44.658	45.727
340.5	44.887	45.963
341	45.114	46.198
341.5	45.338	46.425
342	45.568	46.657
342.5	45.786	46.888
343	46.012	47.111
343.5	46.233	47.329
344	46.454	47.554
344.5	46.67	47.772
345	46.892	47.99
345.5	47.098	48.199
346	47.309	48.414
346.5	47.507	48.627
347	47.713	48.835
347.5	47.901	49.037
348	48.101	49.246
348.5	48.288	49.446
349	48.482	49.643
349.5	48.655	49.832
350	48.838	50.022
350.5	49.011	50.21
351	49.184	50.392
351.5	49.349	50.569
352	49.517	50.748
352.5	49.681	50.921



353	49.833	51.086
353.5	49.986	51.251
354	50.146	51.42
354.5	50.304	51.584
355	50.453	51.738
355.5	50.609	51.898
356	50.76	52.064
356.5	50.898	52.209
357	51.041	52.358
357.5	51.188	52.516
358	51.333	52.664
358.5	51.466	52.799
359	51.601	52.946
359.5	51.75	53.099
360	51.883	53.239
360.5	52.022	53.382
361	52.168	53.523
361.5	52.31	53.667
362	52.426	53.792
362.5	52.555	53.916
363	52.679	54.042
363.5	52.798	54.163
364	52.916	54.273
364.5	53.044	54.387
365	53.172	54.508
365.5	53.297	54.622
366	53.424	54.739
366.5	53.554	54.853
367	53.67	54.963
367.5	53.786	55.075
368	53.906	55.185
368.5	54.02	55.292
369	54.14	55.407
369.5	54.262	55.519
370	54.384	55.625
370.5	54.501	55.729
371	54.618	55.832
371.5	54.732	55.931
372	54.855	56.035
372.5	54.972	56.14
373	55.088	56.244
373.5	55.21	56.347
374	55.342	56.462
374.5	55.463	56.577

375	55.6	56.694
375.5	55.732	56.806
376	55.868	56.927
376.5	55.991	57.042
377	56.12	57.147
377.5	56.237	57.253
378	56.359	57.374
378.5	56.485	57.486
379	56.611	57.589
379.5	56.734	57.705
380	56.857	57.821
380.5	56.981	57.926
381	57.102	58.036
381.5	57.224	58.147
382	57.348	58.257
382.5	57.483	58.371
383	57.615	58.49
383.5	57.744	58.614
384	57.874	58.741
384.5	58.001	58.87
385	58.124	58.989
385.5	58.257	59.113
386	58.386	59.23
386.5	58.508	59.343
387	58.641	59.459
387.5	58.767	59.582
388	58.889	59.705
388.5	59.018	59.832
389	59.147	59.96
389.5	59.274	60.086
390	59.395	60.212
390.5	59.52	60.337
391	59.642	60.459
391.5	59.77	60.585
392	59.899	60.713
392.5	60.038	60.846
393	60.173	60.981
393.5	60.31	61.117
394	60.444	61.254
394.5	60.564	61.386
395	60.69	61.515
395.5	60.81	61.641
396	60.93	61.769
396.5	61.052	61.894

397	61.187	62.025
397.5	61.313	62.16
398	61.436	62.293
398.5	61.561	62.422
399	61.683	62.548
399.5	61.791	62.68
400	61.9	62.802
400.5	62.022	62.923
401	62.133	63.052
401.5	62.253	63.185
402	62.38	63.307
402.5	62.506	63.436
403	62.619	63.567
403.5	62.737	63.688
404	62.842	63.802
404.5	62.94	63.911
405	63.039	64.019
405.5	63.141	64.12
406	63.242	64.226
406.5	63.339	64.326
407	63.435	64.433
407.5	63.531	64.532
408	63.621	64.634
408.5	63.704	64.727
409	63.795	64.826
409.5	63.886	64.915
410	63.97	65.002
410.5	64.048	65.087
411	64.129	65.166
411.5	64.207	65.244
412	64.277	65.32
412.5	64.345	65.395
413	64.419	65.468
413.5	64.498	65.546
414	64.567	65.621
414.5	64.644	65.699
415	64.725	65.777
415.5	64.803	65.855
416	64.868	65.927
416.5	64.933	65.999
417	64.997	66.069
417.5	65.063	66.134
418	65.125	66.194
418.5	65.191	66.259

419	65.262	66.32
419.5	65.329	66.381
420	65.391	66.441
420.5	65.452	66.506
421	65.513	66.562
421.5	65.57	66.618
422	65.63	66.672
422.5	65.688	66.726
423	65.749	66.772
423.5	65.809	66.825
424	65.87	66.877
424.5	65.933	66.933
425	65.987	66.978
425.5	66.045	67.032
426	66.101	67.088
426.5	66.161	67.138
427	66.216	67.186
427.5	66.272	67.243
428	66.33	67.294
428.5	66.389	67.335
429	66.442	67.382
429.5	66.494	67.426
430	66.556	67.476
430.5	66.618	67.522
431	66.669	67.571
431.5	66.728	67.625
432	66.791	67.669
432.5	66.843	67.706
433	66.894	67.752
433.5	66.951	67.798
434	67.004	67.838
434.5	67.054	67.882
435	67.102	67.933
435.5	67.16	67.98
436	67.217	68.026
436.5	67.272	68.072
437	67.329	68.128
437.5	67.395	68.175
438	67.454	68.224
438.5	67.516	68.272
439	67.577	68.327
439.5	67.645	68.376
440	67.711	68.434
440.5	67.772	68.488

441	67.84	68.552
441.5	67.911	68.61
442	67.974	68.668
442.5	68.034	68.733
443	68.101	68.791
443.5	68.164	68.847
444	68.233	68.91
444.5	68.31	68.979
445	68.388	69.038
445.5	68.47	69.107
446	68.549	69.176
446.5	68.631	69.254
447	68.707	69.32
447.5	68.783	69.392
448	68.859	69.472
448.5	68.938	69.546
449	69.011	69.611
449.5	69.091	69.687
450	69.168	69.763
450.5	69.253	69.836
451	69.336	69.91
451.5	69.418	69.985
452	69.506	70.069
452.5	69.594	70.147
453	69.677	70.228
453.5	69.759	70.313
454	69.844	70.392
454.5	69.922	70.473
455	70.006	70.556
455.5	70.084	70.633
456	70.167	70.713
456.5	70.247	70.794
457	70.331	70.879
457.5	70.424	70.973
458	70.523	71.066
458.5	70.614	71.162
459	70.706	71.256
459.5	70.787	71.339
460	70.873	71.425
460.5	70.949	71.507
461	71.034	71.581
461.5	71.115	71.669
462	71.207	71.752
462.5	71.285	71.831

463	71.374	71.918
463.5	71.456	72.011
464	71.538	72.096
464.5	71.624	72.183
465	71.697	72.264
465.5	71.767	72.35
466	71.838	72.431
466.5	71.918	72.51
467	72.001	72.594
467.5	72.081	72.678
468	72.158	72.751
468.5	72.235	72.821
469	72.308	72.902
469.5	72.364	72.975
470	72.436	73.047
470.5	72.508	73.119
471	72.587	73.207
471.5	72.655	73.278
472	72.734	73.355
472.5	72.807	73.428
473	72.871	73.502
473.5	72.934	73.563
474	73	73.629
474.5	73.053	73.692
475	73.113	73.756
475.5	73.175	73.817
476	73.236	73.883
476.5	73.296	73.953
477	73.367	74.023
477.5	73.432	74.089
478	73.492	74.156
478.5	73.55	74.221
479	73.614	74.28
479.5	73.669	74.339
480	73.723	74.404
480.5	73.786	74.467
481	73.842	74.523
481.5	73.895	74.579
482	73.951	74.642
482.5	74.009	74.701
483	74.058	74.751
483.5	74.11	74.809
484	74.157	74.868
484.5	74.211	74.916

485	74.249	74.959
485.5	74.297	75.014
486	74.351	75.062
486.5	74.399	75.11
487	74.445	75.156
487.5	74.499	75.205
488	74.549	75.245
488.5	74.591	75.29
489	74.631	75.334
489.5	74.675	75.37
490	74.718	75.412
490.5	74.746	75.458
491	74.773	75.495
491.5	74.813	75.528
492	74.839	75.568
492.5	74.868	75.599
493	74.907	75.629
493.5	74.947	75.662
494	74.974	75.693
494.5	75.001	75.725
495	75.029	75.756
495.5	75.056	75.78
496	75.075	75.805
496.5	75.098	75.831
497	75.129	75.849
497.5	75.156	75.87
498	75.178	75.897
498.5	75.211	75.92
499	75.245	75.945
499.5	75.268	75.967
500	75.288	75.989
500.5	75.312	76.013
501	75.333	76.032
501.5	75.342	76.044
502	75.359	76.072
502.5	75.387	76.086
503	75.409	76.098
503.5	75.425	76.107
504	75.449	76.122
504.5	75.474	76.127
505	75.491	76.142
505.5	75.508	76.159
506	75.525	76.178
506.5	75.549	76.193

507	75.569	76.207
507.5	75.58	76.225
508	75.603	76.237
508.5	75.625	76.248
509	75.649	76.267
509.5	75.669	76.286
510	75.697	76.3
510.5	75.716	76.318
511	75.734	76.34
511.5	75.746	76.354
512	75.765	76.371
512.5	75.783	76.385
513	75.793	76.399
513.5	75.823	76.417
514	75.84	76.431
514.5	75.858	76.446
515	75.871	76.461
515.5	75.902	76.478
516	75.913	76.484
516.5	75.939	76.499
517	75.953	76.513
517.5	75.985	76.537
518	76.005	76.551
518.5	76.027	76.568
519	76.05	76.592
519.5	76.079	76.608
520	76.101	76.622
520.5	76.125	76.64
521	76.155	76.665
521.5	76.18	76.678
522	76.201	76.702
522.5	76.227	76.72
523	76.25	76.74
523.5	76.27	76.763
524	76.297	76.789
524.5	76.334	76.812
525	76.356	76.834
525.5	76.387	76.859
526	76.416	76.88
526.5	76.453	76.912
527	76.475	76.936
527.5	76.509	76.97
528	76.542	77.001
528.5	76.578	77.031



529	76.605	77.055
529.5	76.649	77.095
530	76.69	77.128
530.5	76.719	77.154
531	76.756	77.183
531.5	76.787	77.206
532	76.809	77.226
532.5	76.833	77.245
533	76.873	77.273
533.5	76.905	77.311
534	76.938	77.349
534.5	76.979	77.385
535	77.013	77.422
535.5	77.054	77.463
536	77.083	77.491
536.5	77.127	77.526
537	77.16	77.553
537.5	77.202	77.586
538	77.231	77.617
538.5	77.272	77.647
539	77.303	77.681
539.5	77.342	77.722
540	77.379	77.763
540.5	77.421	77.804
541	77.462	77.849
541.5	77.506	77.887
542	77.555	77.925
542.5	77.597	77.966
543	77.637	78
543.5	77.671	78.036
544	77.709	78.076
544.5	77.747	78.116
545	77.787	78.153
545.5	77.831	78.199
546	77.881	78.244
546.5	77.928	78.287
547	77.966	78.329
547.5	78.014	78.375
548	78.055	78.412
548.5	78.096	78.456
549	78.138	78.497
549.5	78.186	78.536
550	78.234	78.581
550.5	78.286	78.627

551	78.335	78.67
551.5	78.376	78.716
552	78.423	78.766
552.5	78.459	78.809
553	78.502	78.858
553.5	78.547	78.909
554	78.603	78.962
554.5	78.644	79.008
555	78.694	79.053
555.5	78.74	79.102
556	78.778	79.144
556.5	78.82	79.185
557	78.866	79.232
557.5	78.916	79.283
558	78.954	79.322
558.5	79.012	79.366
559	79.056	79.405
559.5	79.103	79.453
560	79.137	79.486
560.5	79.187	79.532
561	79.221	79.579
561.5	79.258	79.629
562	79.299	79.668
562.5	79.349	79.719
563	79.399	79.768
563.5	79.446	79.81
564	79.499	79.85
564.5	79.544	79.888
565	79.582	79.93
565.5	79.615	79.966
566	79.654	80
566.5	79.689	80.042
567	79.726	80.086
567.5	79.769	80.118
568	79.804	80.161
568.5	79.844	80.207
569	79.875	80.247
569.5	79.91	80.282
570	79.942	80.323
570.5	79.974	80.356
571	80.001	80.39
571.5	80.04	80.424
572	80.065	80.454
572.5	80.088	80.486

573	80.121	80.518
573.5	80.148	80.551
574	80.184	80.583
574.5	80.213	80.621
575	80.247	80.655
575.5	80.277	80.689
576	80.306	80.717
576.5	80.318	80.74
577	80.353	80.761
577.5	80.381	80.787
578	80.406	80.816
578.5	80.435	80.845
579	80.468	80.875
579.5	80.498	80.906
580	80.518	80.932
580.5	80.547	80.954
581	80.574	80.977
581.5	80.608	81.014
582	80.629	81.042
582.5	80.66	81.067
583	80.674	81.095
583.5	80.697	81.119
584	80.711	81.135
584.5	80.738	81.157
585	80.764	81.184
585.5	80.797	81.205
586	80.822	81.235
586.5	80.85	81.263
587	80.876	81.289
587.5	80.904	81.32
588	80.925	81.342
588.5	80.952	81.374
589	80.97	81.397
589.5	80.988	81.429
590	80.998	81.447
590.5	81.014	81.472
591	81.037	81.486
591.5	81.054	81.499
592	81.074	81.507
592.5	81.092	81.516
593	81.115	81.535
593.5	81.125	81.558
594	81.145	81.582
594.5	81.153	81.601

595	81.17	81.623
595.5	81.185	81.639
596	81.199	81.644
596.5	81.206	81.654
597	81.21	81.658
597.5	81.218	81.666
598	81.222	81.66
598.5	81.225	81.665
599	81.232	81.669
599.5	81.255	81.684
600	81.264	81.696
600.5	81.277	81.719
601	81.293	81.736
601.5	81.307	81.749
602	81.318	81.758
602.5	81.327	81.767
603	81.333	81.772
603.5	81.338	81.772
604	81.348	81.778
604.5	81.345	81.792
605	81.356	81.795
605.5	81.369	81.803
606	81.376	81.808
606.5	81.383	81.818
607	81.398	81.813
607.5	81.409	81.823
608	81.406	81.822
608.5	81.416	81.833
609	81.419	81.83
609.5	81.418	81.839
610	81.411	81.842
610.5	81.417	81.844
611	81.418	81.848
611.5	81.421	81.852
612	81.419	81.851
612.5	81.43	81.852
613	81.43	81.86
613.5	81.425	81.855
614	81.431	81.859
614.5	81.437	81.859
615	81.43	81.857
615.5	81.439	81.86
616	81.446	81.856
616.5	81.443	81.849

617	81.451	81.85
617.5	81.457	81.856
618	81.451	81.848
618.5	81.45	81.851
619	81.446	81.851
619.5	81.443	81.849
620	81.445	81.843
620.5	81.455	81.845
621	81.461	81.85
621.5	81.47	81.85
622	81.468	81.854
622.5	81.469	81.853
623	81.467	81.861
623.5	81.466	81.854
624	81.47	81.862
624.5	81.474	81.86
625	81.476	81.862
625.5	81.475	81.849
626	81.472	81.852
626.5	81.468	81.85
627	81.467	81.839
627.5	81.46	81.835
628	81.464	81.842
628.5	81.473	81.842
629	81.476	81.836
629.5	81.481	81.845
630	81.485	81.847
630.5	81.484	81.843
631	81.484	81.836
631.5	81.485	81.843
632	81.488	81.858
632.5	81.496	81.865
633	81.501	81.865
633.5	81.506	81.876
634	81.511	81.881
634.5	81.519	81.866
635	81.52	81.856
635.5	81.513	81.853
636	81.522	81.853
636.5	81.53	81.845
637	81.531	81.852
637.5	81.534	81.863
638	81.553	81.865
638.5	81.545	81.862

639	81.548	81.862
639.5	81.551	81.864
640	81.565	81.866
640.5	81.574	81.876
641	81.585	81.882
641.5	81.587	81.894
642	81.591	81.889
642.5	81.594	81.89
643	81.599	81.897
643.5	81.609	81.899
644	81.621	81.899
644.5	81.633	81.904
645	81.635	81.91
645.5	81.636	81.913
646	81.64	81.919
646.5	81.641	81.919
647	81.637	81.927
647.5	81.645	81.926
648	81.656	81.931
648.5	81.657	81.94
649	81.663	81.945
649.5	81.674	81.95
650	81.685	81.953
650.5	81.689	81.954
651	81.71	81.957
651.5	81.732	81.965
652	81.747	81.976
652.5	81.752	81.99
653	81.763	81.999
653.5	81.766	82.01
654	81.772	82.031
654.5	81.78	82.04
655	81.784	82.05
655.5	81.794	82.06
656	81.806	82.074
656.5	81.813	82.067
657	81.833	82.078
657.5	81.847	82.075
658	81.858	82.081
658.5	81.865	82.076
659	81.872	82.087
659.5	81.883	82.103
660	81.899	82.115
660.5	81.903	82.138

661	81.918	82.151
661.5	81.915	82.156
662	81.917	82.15
662.5	81.925	82.162
663	81.927	82.147
663.5	81.941	82.163
664	81.958	82.169
664.5	81.956	82.175
665	81.961	82.189
665.5	81.978	82.2
666	81.978	82.206
666.5	82.002	82.23
667	82.018	82.249
667.5	82.025	82.253
668	82.036	82.264
668.5	82.046	82.273
669	82.06	82.29
669.5	82.072	82.287
670	82.085	82.297
670.5	82.098	82.315
671	82.123	82.332
671.5	82.127	82.335
672	82.131	82.346
672.5	82.147	82.348
673	82.166	82.352
673.5	82.164	82.355
674	82.171	82.361
674.5	82.19	82.37
675	82.203	82.395
675.5	82.212	82.417
676	82.234	82.433
676.5	82.258	82.457
677	82.284	82.473
677.5	82.291	82.49
678	82.313	82.502
678.5	82.336	82.525
679	82.336	82.528
679.5	82.329	82.536
680	82.343	82.533
680.5	82.34	82.539
681	82.335	82.535
681.5	82.349	82.532
682	82.369	82.546
682.5	82.386	82.566

683	82.402	82.576
683.5	82.413	82.584
684	82.424	82.597
684.5	82.451	82.617
685	82.477	82.633
685.5	82.494	82.652
686	82.502	82.665
686.5	82.522	82.694
687	82.527	82.712
687.5	82.529	82.717
688	82.536	82.719
688.5	82.559	82.741
689	82.571	82.742
689.5	82.579	82.741
690	82.59	82.748
690.5	82.609	82.772
691	82.611	82.776
691.5	82.609	82.782
692	82.622	82.795
692.5	82.621	82.808
693	82.625	82.81
693.5	82.646	82.83
694	82.673	82.847
694.5	82.677	82.863
695	82.706	82.879
695.5	82.72	82.887
696	82.727	82.897
696.5	82.731	82.912
697	82.745	82.909
697.5	82.751	82.924
698	82.765	82.941
698.5	82.771	82.945
699	82.783	82.947
699.5	82.795	82.971
700	82.799	82.978
700.5	82.808	82.991
701	82.813	82.995
701.5	82.825	83.019
702	82.827	83.037
702.5	82.841	83.034
703	82.838	83.039
703.5	82.856	83.06
704	82.855	83.055
704.5	82.868	83.054



705	82.877	83.066
705.5	82.894	83.079
706	82.896	83.087
706.5	82.909	83.096
707	82.919	83.105
707.5	82.913	83.116
708	82.918	83.119
708.5	82.923	83.115
709	82.932	83.137
709.5	82.926	83.14
710	82.936	83.141
710.5	82.948	83.142
711	82.965	83.152
711.5	82.964	83.146
712	82.98	83.144
712.5	82.997	83.154
713	82.992	83.16
713.5	82.994	83.163
714	83.002	83.169
714.5	83.009	83.179
715	83.006	83.18
715.5	83.019	83.193
716	83.022	83.196
716.5	83.023	83.195
717	83.025	83.204
717.5	83.024	83.208
718	83.018	83.201
718.5	83.016	83.204
719	83.017	83.211
719.5	82.891	83.102
720	82.769	82.988
720.5	82.646	82.876
721	82.53	82.762
721.5	82.411	82.648
722	82.407	82.637
722.5	82.409	82.638
723	82.41	82.638
723.5	82.407	82.645
724	82.405	82.65
724.5	82.405	82.656
725	82.411	82.654
725.5	82.417	82.665
726	82.418	82.668
726.5	82.413	82.667

727	82.414	82.66
727.5	82.409	82.668
728	82.407	82.665
728.5	82.404	82.652
729	82.403	82.649
729.5	82.408	82.658
730	82.411	82.663
730.5	82.408	82.657
731	82.401	82.655
731.5	82.4	82.647
732	82.401	82.647
732.5	82.392	82.635
733	82.381	82.638
733.5	82.376	82.633
734	82.377	82.631
734.5	82.371	82.628
735	82.367	82.624
735.5	82.361	82.61
736	82.361	82.6
736.5	82.357	82.602
737	82.354	82.589
737.5	82.354	82.576
738	82.352	82.563
738.5	82.356	82.57
739	82.352	82.57
739.5	82.345	82.561
740	82.34	82.557
740.5	82.338	82.568
741	82.331	82.562
741.5	82.323	82.552
742	82.309	82.548
742.5	82.302	82.546
743	82.293	82.541
743.5	82.277	82.528
744	82.269	82.519
744.5	82.264	82.515
745	82.259	82.511
745.5	82.26	82.494
746	82.255	82.486
746.5	82.246	82.473
747	82.246	82.465
747.5	82.229	82.448
748	82.208	82.432
748.5	82.194	82.426

749	82.197	82.422
749.5	82.175	82.404
750	82.166	82.403
750.5	82.164	82.4
751	82.165	82.391
751.5	82.15	82.384
752	82.145	82.38
752.5	82.139	82.364
753	82.127	82.363
753.5	82.109	82.358
754	82.099	82.345
754.5	82.089	82.321
755	82.076	82.309
755.5	82.068	82.298
756	82.064	82.286
756.5	82.042	82.269
757	82.03	82.267
757.5	82.012	82.257
758	81.993	82.238
758.5	81.983	82.227
759	81.978	82.22
759.5	81.963	82.21
760	81.959	82.194
760.5	81.961	82.184
761	81.945	82.169
761.5	81.937	82.163
762	81.934	82.151
762.5	81.926	82.153
763	81.9	82.143
763.5	81.892	82.135
764	81.876	82.111
764.5	81.859	82.106
765	81.844	82.077
765.5	81.834	82.053
766	81.812	82.036
766.5	81.8	82.032
767	81.789	82.006
767.5	81.781	82.001
768	81.771	82.002
768.5	81.755	81.986
769	81.741	81.954
769.5	81.729	81.942
770	81.71	81.928
770.5	81.699	81.908

771	81.689	81.894
771.5	81.67	81.887
772	81.651	81.872
772.5	81.64	81.856
773	81.624	81.841
773.5	81.615	81.833
774	81.605	81.825
774.5	81.602	81.822
775	81.584	81.802
775.5	81.573	81.788
776	81.557	81.763
776.5	81.546	81.742
777	81.516	81.72
777.5	81.504	81.709
778	81.495	81.69
778.5	81.487	81.688
779	81.487	81.689
779.5	81.477	81.674
780	81.465	81.656
780.5	81.445	81.65
781	81.426	81.633
781.5	81.4	81.609
782	81.389	81.596
782.5	81.371	81.587
783	81.358	81.578
783.5	81.351	81.569
784	81.328	81.546
784.5	81.321	81.532
785	81.311	81.514
785.5	81.311	81.497
786	81.297	81.475
786.5	81.291	81.464
787	81.271	81.454
787.5	81.258	81.448
788	81.247	81.435
788.5	81.234	81.425
789	81.219	81.421
789.5	81.206	81.407
790	81.208	81.393
790.5	81.179	81.376
791	81.159	81.354
791.5	81.157	81.341
792	81.155	81.329
792.5	81.139	81.32

793	81.124	81.301
793.5	81.121	81.296
794	81.098	81.278
794.5	81.079	81.261
795	81.059	81.237
795.5	81.053	81.224
796	81.031	81.212
796.5	81.026	81.196
797	81.011	81.185
797.5	80.992	81.176
798	80.981	81.175
798.5	80.977	81.158
799	80.963	81.155
799.5	80.955	81.151
800	80.955	81.151

### The J-V data of the CBD-SnO<sub>2</sub> and CBD-SSO

Voltage (V)	CBD-SnO <sub>2</sub>	CBD-SSO
2	0.19904	0.23497
1.91835	0.19668	0.22313
1.83675	0.18415	0.2109
1.7551	0.17871	0.21131
1.67345	0.1677	0.20027
1.59185	0.15549	0.18883
1.5102	0.14174	0.17732
1.42855	0.13357	0.16649
1.34695	0.10793	0.15613
1.2653	0.10227	0.14551
1.18365	0.09549	0.13505
1.10205	0.08949	0.12505
1.0204	0.08315	0.1148
0.9388	0.07674	0.10492
0.85715	0.07039	0.09498
0.7755	0.06401	0.08525
0.6939	0.0575	0.0757
0.61225	0.05085	0.06632
0.5306	0.0441	0.05708
0.449	0.03727	0.04797
0.36735	0.03039	0.039
0.2857	0.02352	0.03016
0.2041	0.01667	0.02141
0.12245	0.00988	0.01276
0.0408	0.00326	0.00421
-0.0408	-0.00325	-0.00423
-0.12245	-0.00968	-0.01257
-0.2041	-0.01601	-0.02093
-0.2857	-0.02225	-0.02925
-0.36735	-0.02838	-0.0375
-0.449	-0.03439	-0.04583
-0.5306	-0.0403	-0.05419
-0.61225	-0.04607	-0.06258
-0.6939	-0.05173	-0.07098
-0.7755	-0.05727	-0.07944
-0.85715	-0.06268	-0.08792
-0.9388	-0.06825	-0.09647
-1.0204	-0.07352	-0.10499
-1.10205	-0.07891	-0.11386
-1.18365	-0.08426	-0.12305
-1.2653	-0.08975	-0.1307
-1.34695	-0.0959	-0.13747
-1.42855	-0.10176	-0.1447
-1.5102	-0.1054	-0.15256

-1.59185	-0.10489	-0.16065
-1.67345	-0.11886	-0.16916
-1.7551	-0.13164	-0.17783
-1.83675	-0.14295	-0.18665
-1.91835	-0.15202	-0.19594
-2	-0.1611	-0.20507

### XPS scan of the S 2p of SnO<sub>2</sub> and SSO

174.08	5187.22	5030.753	5030	4989.25	5030
173.98	5371.54	5030.722	5030	4931.91	5030
173.88	5468.63	5030.691	5030	4904.99	5030
173.78	5307.93	5030.661	5030	5048.43	5030
173.68	5397.2	5030.63	5030	4934.84	5030
173.58	5312.29	5030.599	5030	4904.59	5030
173.48	5404.88	5030.568	5030	4919.03	5030
173.38	5441.47	5030.537	5030	4956.83	5030
173.28	5346.52	5030.506	5030	5132.66	5030
173.18	5257.29	5030.476	5030	5083.22	5030
173.08	5193.38	5030.445	5030	5058.46	5030
172.98	5295.64	5030.414	5030	4998.96	5030
172.88	5382.5	5030.383	5030	5011.49	5030
172.78	5381.74	5030.352	5030	4927.93	5030
172.68	5320.38	5030.321	5030	5080.44	5030
172.58	5320.57	5030.291	5030	5077.69	5030
172.48	5092.85	5030.26	5030	4960.86	5030
172.38	5301.56	5030.229	5030	4924.03	5030
172.28	5394.06	5030.198	5030	5004.77	5030
172.18	5391.68	5030.167	5030	5053.93	5030
172.08	5450.01	5031.273	5030	5035.71	5030
171.98	5466.45	5031.39	5030	5001.81	5030
171.88	5514.77	5031.554	5030	5027.47	5030
171.78	5472.81	5031.78	5030	5043.15	5030
171.68	5348.11	5032.086	5030	5028.01	5030
171.58	5445.96	5032.492	5030	5066.44	5030
171.48	5395.62	5033.024	5030	5073.83	5030
171.38	5412.17	5033.71	5030	4997.75	5030
171.28	5401.61	5034.585	5030	4995.25	5030
171.18	5321.74	5035.688	5030	5056.17	5030
171.08	5373.76	5037.059	5030	5090.89	5030
170.98	5348.13	5038.749	5030	5098.85	5030
170.88	5484.35	5040.804	5030	5074.18	5030
170.78	5578.55	5043.279	5030	4920.7	5030
170.68	5613.2	5046.225	5030	4945.33	5030
170.58	5353.92	5049.693	5030	4992.81	5030
170.48	5332.77	5053.729	5030	5114.46	5030
170.38	5439.18	5058.374	5030	4878.27	5030
170.28	5390.84	5063.657	5030	5082.18	5030
170.18	5601.94	5069.596	5030	5113.25	5030
170.08	5447.13	5076.188	5030	5035.03	5030
169.98	5468.25	5083.418	5030	5112.53	5030



169.88	5458.94	5091.244	5030	5180.55	5030
169.78	5433.12	5099.604	5030	5220.46	5030
169.68	5380.61	5108.409	5030	5203.88	5030
169.58	5577.68	5117.544	5030	5077.09	5030
169.48	5468.71	5126.877	5030	5178.93	5030
169.38	5332.59	5136.248	5030	5166.7	5030
169.28	5467.78	5145.485	5030	5092.13	5030
169.18	5393.5	5154.399	5030	5289.41	5030
169.08	5431.09	5162.796	5030	5145.05	5030
168.98	5392.98	5170.485	5030	5204.41	5030
168.88	5417.86	5177.277	5030	5096.06	5030
168.78	5412.79	5183.004	5030	5150.79	5030
168.68	5300.37	5187.512	5030	5142.52	5030
168.58	5383.54	5190.681	5030	5248.45	5030
168.48	5514.3	5192.423	5030	5217.62	5030
168.38	5426.46	5192.69	5030	5164.58	5030
168.28	5494.97	5191.473	5030	5158.77	5030
168.18	5482.5	5188.803	5030	5079.77	5030
168.08	5528.5	5184.757	5030	5193.38	5030
167.98	5567.39	5179.439	5030	5258.04	5030
167.88	5359.95	5172.993	5030	5107.19	5030
167.78	5426.69	5165.579	5030	5170.08	5030
167.68	5538.94	5157.379	5030	5120.35	5030
167.58	5533.93	5148.587	5030	5112.71	5030
167.48	5410.72	5139.395	5030	5061.18	5030
167.38	5441.63	5129.995	5030	5132.13	5030
167.28	5504.07	5120.565	5030	5244.43	5030
167.18	5567.97	5111.271	5030	5186.88	5030
167.08	5436.45	5102.258	5030	5192.92	5030
166.98	5385.53	5093.646	5030	5190.42	5030
166.88	5351.38	5085.537	5030	5152.26	5030
166.78	5431.49	5078	5030	5185.8	5030
166.68	5400.46	5071.087	5030	5127.51	5030
166.58	5401.8	5064.825	5030	5055.04	5030
166.48	5366.26	5059.219	5030	5250.36	5030
166.38	5431.32	5054.261	5030	5268.28	5030
166.28	5478.52	5049.924	5030	5173.04	5030
166.18	5570.56	5046.172	5030	5051.1	5030
166.08	5545.82	5042.961	5030	5007.77	5030
165.98	5286.76	5040.243	5030	5134.25	5030
165.88	5355.12	5037.964	5030	5138.62	5030
165.78	5447.63	5036.073	5030	4983.23	5030
165.68	5420.62	5034.518	5030	5051.12	5030
165.58	5543.37	5033.252	5030	5142.09	5030







## FTIR of SnO<sub>2</sub>, SSO, and H<sub>2</sub>SO<sub>4</sub>

500.4454	94.50378	75.00712	92.2331
500.9275	94.41347	74.9341	92.26058
501.4096	94.30776	74.88026	92.28847
501.8917	94.18702	74.84562	92.31251
502.3739	94.05603	74.82777	92.32828
502.856	93.91873	74.82199	92.33213
503.3381	93.77529	74.82187	92.32184
503.8203	93.62453	74.82047	92.29688
504.3024	93.46918	74.81172	92.25827
504.7845	93.32073	74.79167	92.20807
505.2666	93.19794	74.75903	92.14872
505.7487	93.12038	74.71479	92.08229
506.2309	93.09642	74.66124	92.00993
506.713	93.1145	74.60062	91.93155
507.1951	93.14187	74.53412	91.84617
507.6772	93.13539	74.4614	91.75268
508.1594	93.05919	74.38099	91.65093
508.6415	92.89964	74.29103	91.54259
509.1236	92.6731	74.19021	91.4315
509.6057	92.42043	74.07836	91.32326
510.0879	92.19353	73.95645	91.22408
510.57	92.03685	73.82614	91.13927
511.0521	91.97209	73.6891	91.07166
511.5342	91.99368	73.54643	91.02072
512.0164	92.07487	73.39855	90.98265
512.4985	92.1797	73.24542	90.9511
512.9806	92.27628	73.08693	90.91872
513.4627	92.34359	72.92335	90.87868
513.9448	92.37483	72.75569	90.82617
514.427	92.37531	72.58578	90.75927
514.9091	92.35844	72.41624	90.6792
515.3912	92.34329	72.25027	90.58978
515.8734	92.35092	72.0914	90.49635
516.3555	92.40183	71.94321	90.40472
516.8376	92.51013	71.80896	90.3202
517.3197	92.67526	71.69108	90.24703
517.8019	92.87525	71.59064	90.18796
518.284	93.06644	71.50695	90.14403
518.7661	93.19434	71.43753	90.1146
519.2482	93.21183	71.37872	90.09761
519.7303	93.09731	71.3267	90.09031
520.2125	92.86512	71.2787	90.08995

520.6946	92.56334	71.23369	90.09444
521.1767	92.25956	71.19239	90.10253
521.6588	92.02037	71.15664	90.11369
522.141	91.89062	71.12831	90.12776
522.6231	91.88175	71.10818	90.14441
523.1052	91.97215	71.09517	90.16259
523.5873	92.11935	71.08606	90.18019
524.0695	92.27437	71.07592	90.19379
524.5516	92.39426	71.05906	90.19898
525.0337	92.44788	71.03015	90.19076
525.5159	92.41724	70.98527	90.16446
525.998	92.29549	70.92242	90.11661
526.4801	92.08495	70.84168	90.04575
526.9622	91.79737	70.74477	89.95285
527.4443	91.45646	70.63434	89.84115
527.9265	91.10035	70.51317	89.7155
528.4086	90.77991	70.38343	89.58143
528.8907	90.55025	70.24622	89.44392
529.3728	90.45681	70.10142	89.30642
529.855	90.52009	69.94794	89.17032
530.3371	90.72654	69.78428	89.035
530.8192	91.03148	69.60932	88.89857
531.3013	91.37352	69.42301	88.75886
531.7834	91.69282	69.22671	88.61443
532.2656	91.94701	69.02313	88.46523
532.7477	92.11868	68.81581	88.31275
533.2299	92.21405	68.60837	88.15963
533.712	92.2537	68.40372	88.00896
534.1941	92.26215	68.20346	87.86346
534.6762	92.25916	68.00766	87.72501
535.1583	92.25849	67.81507	87.59445
535.6404	92.27048	67.62365	87.47183
536.1226	92.30533	67.43137	87.35672
536.6047	92.37271	67.23683	87.24855
537.0868	92.47729	67.03969	87.14683
537.569	92.61272	66.84078	87.05115
538.0511	92.75901	66.64188	86.96114
538.5332	92.88635	66.44526	86.87627
539.0153	92.96532	66.25323	86.79584
539.4974	92.97846	66.06779	86.71903
539.9796	92.92891	65.89044	86.64533
540.4617	92.84092	65.72206	86.57467
540.9438	92.7516	65.56284	86.50769
541.426	92.69688	65.41218	86.44543

541.9081 92.69766 65.26868 86.38899  
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649.904	98.00366	94.37107	97.68745
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651.8325	98.16298	93.99084	97.49765
652.3146	98.23892	93.88604	97.43889
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655.2073	98.34549	93.23645	97.00375
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657.1359	97.92155	92.86861	96.78338
657.6179	97.88104	92.79192	96.75471
658.1001	97.89305	92.7171	96.73561
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659.0643	98.05322	92.56363	96.71866
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662.9213	98.92677	91.83862	96.62535
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672.5638	98.53438	89.75723	96.32805
673.046	98.58256	89.64855	96.31435
673.5281	98.6379	89.53549	96.29901
674.0102	98.69236	89.41789	96.28136
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734.2758	99.37666	76.58499	93.36621
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735.24	99.52618	76.3752	93.32477
735.7222	99.5895	76.26867	93.29827
736.2042	99.63493	76.15965	93.2677
736.6864	99.65708	76.04739	93.23349
737.1685	99.65364	75.93168	93.19654
737.6506	99.62613	75.81289	93.15805
738.1328	99.57969	75.69194	93.11929
738.6149	99.52229	75.57009	93.08136
739.097	99.46261	75.4487	93.04498
739.5791	99.40813	75.32906	93.01041
740.0613	99.36369	75.21222	92.97753
740.5434	99.331	75.0989	92.94593
741.0255	99.30926	74.98946	92.91503
741.5076	99.29616	74.88398	92.88418
741.9897	99.289	74.78227	92.85274
742.4719	99.28574	74.68407	92.82015
742.954	99.2849	74.58908	92.78601
743.4362	99.2858	74.49714	92.75013
743.9182	99.28809	74.40814	92.71263
744.4004	99.29188	74.32195	92.67388
744.8825	99.29774	74.23827	92.63443
745.3646	99.30688	74.15646	92.59484
745.8467	99.32095	74.07547	92.55555
746.3289	99.34155	73.994	92.51676
746.811	99.36932	73.91067	92.47847
747.2931	99.40332	73.82438	92.44055
747.7753	99.44075	73.73455	92.40286
748.2574	99.47746	73.64127	92.36539
748.7395	99.50911	73.54518	92.32819
749.2216	99.53239	73.44728	92.29131
749.7037	99.54602	73.34864	92.25471
750.1859	99.55099	73.25015	92.21815
750.668	99.54943	73.15233	92.18123
751.1501	99.5434	73.05529	92.14356
751.6322	99.53368	72.95885	92.10494
752.1144	99.51929	72.86258	92.06551
752.5965	99.49855	72.76595	92.02576
753.0786	99.47038	72.66839	91.98644
753.5608	99.43613	72.56934	91.94829



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754.525	99.37051	72.36517	91.87717
755.0071	99.35424	72.2598	91.84404
755.4893	99.35797	72.1525	91.81192
755.9714	99.38425	72.04377	91.78022
756.4535	99.4309	71.93418	91.74852
756.9356	99.49157	71.82419	91.71663
757.4177	99.55746	71.71404	91.68455
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758.382	99.67216	71.49274	91.62059
758.8641	99.71088	71.38098	91.58906
759.3463	99.73514	71.26821	91.55801
759.8284	99.74564	71.15461	91.52757
760.3105	99.74334	71.04071	91.49792
760.7926	99.72873	70.92733	91.46931
761.2748	99.70225	70.81534	91.442
761.7568	99.66511	70.70549	91.4162
762.239	99.62027	70.59814	91.39198
762.7211	99.57272	70.49324	91.3692
763.2032	99.52893	70.39034	91.34751
763.6854	99.49522	70.28869	91.32646
764.1675	99.47612	70.18746	91.30553
764.6496	99.47269	70.08584	91.28425
765.1317	99.48221	69.98322	91.26225
765.6139	99.49877	69.87922	91.23926
766.0959	99.51555	69.7737	91.21515
766.5781	99.52679	69.66671	91.18984
767.0602	99.52982	69.55837	91.16331
767.5424	99.52574	69.44887	91.13557
768.0245	99.51858	69.3383	91.10659
768.5066	99.51353	69.22672	91.07632
768.9888	99.5148	69.11416	91.04467
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773.8099	99.38132	67.96939	90.64945
774.2921	99.35558	67.85487	90.60544
774.7742	99.34254	67.73967	90.56164

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783.4525	99.3201	65.59468	89.7962
783.9346	99.33554	65.47165	89.74845
784.4167	99.34489	65.34906	89.70185
784.8988	99.34356	65.22715	89.65703
785.381	99.32908	65.10599	89.6144
785.8631	99.30241	64.98552	89.57408
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786.8273	99.23512	64.74607	89.4999
787.3094	99.21134	64.62672	89.46539
787.7916	99.20445	64.50733	89.43197
788.2737	99.218	64.38761	89.39907
788.7559	99.25034	64.2672	89.36606
789.238	99.29523	64.14568	89.33232
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791.6486	99.44258	63.51362	89.14415
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792.6128	99.44627	63.25487	89.06385
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793.5771	99.47102	63.00028	88.98383
794.0592	99.49392	62.87502	88.94368
794.5413	99.51942	62.7506	88.9032
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798.8805	99.52718	61.57685	88.54284
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812.3799	99.22601	57.64604	87.31155
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813.3442	99.21327	57.35241	87.21767
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819.6118	99.47347	55.26828	86.51645
820.0939	99.45006	55.10248	86.45441
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821.5403	99.30442	54.60588	86.2704
822.0225	99.25941	54.44038	86.2101
822.5045	99.23091	54.27449	86.1502
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823.9509	99.26408	53.77485	85.9716
824.433	99.2998	53.60884	85.91199
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828.29	99.19395	52.28736	85.41826
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919.8937	99.24381	45.17031	78.39961
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920.858	99.26827	45.22029	78.45134
921.3401	99.27219	45.23949	78.4745
921.8222	99.26931	45.25512	78.49516
922.3043	99.26012	45.26707	78.51277
922.7864	99.24585	45.27515	78.52699
923.2686	99.22774	45.27924	78.53779



923.7507	99.20675	45.27948	78.5455
924.2328	99.18362	45.27626	78.55063
924.715	99.15915	45.27006	78.55374
925.1971	99.13451	45.26127	78.55517
925.6792	99.11153	45.25	78.55498
926.1613	99.09201	45.23613	78.55296
926.6434	99.07729	45.21941	78.54879
927.1255	99.06725	45.19968	78.5422
927.6077	99.06026	45.17702	78.53313
928.0898	99.05343	45.15175	78.52175
928.572	99.04389	45.12426	78.50836
929.0541	99.03	45.09477	78.49329
929.5362	99.01215	45.0632	78.47673
930.0183	98.99293	45.02915	78.45874
930.5004	98.97625	44.99206	78.43931
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931.4647	98.96346	44.9073	78.39623
931.9468	98.96864	44.85982	78.37294
932.429	98.9783	44.80961	78.34889
932.9111	98.9879	44.75727	78.32434
933.3932	98.99316	44.70324	78.29936
933.8753	98.99123	44.64765	78.27381
934.3574	98.9815	44.59038	78.24735
934.8396	98.96541	44.53129	78.21955
935.3217	98.94569	44.4703	78.18993
935.8038	98.92511	44.4075	78.15807
936.2859	98.90576	44.34305	78.1236
936.7681	98.8885	44.27703	78.08609
937.2502	98.8731	44.20934	78.04509
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938.6966	98.82645	43.99226	77.8962
939.1787	98.80607	43.91409	77.83683
939.6608	98.78101	43.83297	77.7726
940.1429	98.75035	43.74918	77.70387
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941.1072	98.67258	43.57433	77.55494
941.5893	98.62841	43.48317	77.47584
942.0714	98.5841	43.38921	77.39439
942.5536	98.54225	43.29235	77.31121
943.0357	98.50422	43.19275	77.22701
943.5178	98.46915	43.09089	77.14257
943.9999	98.43378	42.98742	77.0587
944.4821	98.39296	42.88296	76.97618

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945.4463	98.273	42.67212	76.81781
945.9284	98.18681	42.56555	76.74301
946.4106	98.08327	42.45792	76.67177
946.8927	97.96606	42.34918	76.60458
947.3748	97.84109	42.23951	76.54192
947.8569	97.71493	42.12929	76.48422
948.3391	97.59386	42.01886	76.43175
948.8212	97.48332	41.9084	76.38458
949.3033	97.38778	41.79784	76.34256
949.7855	97.31104	41.68692	76.30541
950.2676	97.25662	41.57543	76.27284
950.7497	97.22794	41.46328	76.24463
951.2318	97.22791	41.35062	76.22068
951.7139	97.25867	41.23772	76.20093
952.196	97.32071	41.12478	76.18539
952.6782	97.41251	41.01184	76.17398
953.1603	97.52982	40.8987	76.16655
953.6425	97.66613	40.78505	76.16294
954.1246	97.81313	40.67068	76.16297
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956.053	98.35362	40.2087	76.19643
956.5352	98.45525	40.09322	76.21139
957.0173	98.54305	39.97755	76.22748
957.4995	98.61932	39.86127	76.24359
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959.4279	98.85809	39.38763	76.28732
959.91	98.9091	39.26852	76.28929
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961.8386	99.07765	38.79081	76.24768
962.3207	99.10344	38.66931	76.22396
962.8028	99.11983	38.54692	76.19519
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973.4095	99.16661	35.97513	75.17135
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1104.065	99.39517	36.65633	66.8363
1104.547	99.39526	36.58227	66.78358
1105.03	99.38746	36.50794	66.73125
1105.512	99.37416	36.43352	66.6793
1105.994	99.35876	36.35927	66.62776
1106.476	99.34459	36.28534	66.57659
1106.958	99.33375	36.21166	66.52566
1107.44	99.327	36.13789	66.47474
1107.922	99.32385	36.06362	66.42364
1108.404	99.32338	35.98853	66.37227
1108.886	99.32473	35.91259	66.32074
1109.369	99.32764	35.83605	66.26933
1109.851	99.33213	35.75935	66.21837
1110.333	99.33832	35.68289	66.16811
1110.815	99.34564	35.60683	66.11859
1111.297	99.3529	35.53109	66.06965
1111.779	99.35818	35.45544	66.02105
1112.261	99.35947	35.37971	65.97261
1112.744	99.35557	35.30394	65.92436
1113.226	99.34642	35.22839	65.87651
1113.708	99.33364	35.15347	65.82945
1114.19	99.32007	35.07946	65.78349

1114.672	99.30914	35.0064	65.73876
1115.154	99.30399	34.93405	65.69518
1115.636	99.30655	34.86203	65.65246
1116.118	99.31716	34.79	65.61033
1116.601	99.33437	34.71787	65.56859
1117.083	99.35554	34.64582	65.52724
1117.565	99.37746	34.57416	65.48641
1118.047	99.39726	34.50315	65.44623
1118.529	99.41296	34.43283	65.40674
1119.011	99.42375	34.363	65.36782
1119.493	99.43002	34.29333	65.32925
1119.975	99.43288	34.22363	65.29076
1120.458	99.43371	34.15396	65.25217
1120.94	99.43376	34.08468	65.21341
1121.422	99.43386	34.01625	65.1745
1121.904	99.43428	33.94904	65.13542
1122.386	99.43504	33.88306	65.09608
1122.868	99.43596	33.81802	65.0563
1123.35	99.43686	33.75339	65.01585
1123.832	99.43773	33.68873	64.97461
1124.314	99.43873	33.62386	64.93261
1124.797	99.44006	33.559	64.89005
1125.279	99.44195	33.49457	64.84722
1125.761	99.44466	33.43104	64.80433
1126.243	99.44824	33.36864	64.76145
1126.725	99.45269	33.30735	64.71846
1127.207	99.45773	33.2469	64.67512
1127.689	99.4628	33.18706	64.6312
1128.172	99.467	33.12773	64.58657
1128.654	99.46925	33.06905	64.54124
1129.136	99.46857	33.0113	64.49534
1129.618	99.4645	32.95466	64.44894
1130.1	99.45737	32.89912	64.40208
1130.582	99.44852	32.84442	64.35466
1131.064	99.44005	32.79017	64.3066
1131.546	99.43427	32.73609	64.25789
1132.029	99.43307	32.6822	64.20867
1132.511	99.43717	32.62883	64.15922
1132.993	99.44604	32.57649	64.1098
1133.475	99.45792	32.52565	64.06058
1133.957	99.47069	32.47654	64.01151
1134.439	99.48246	32.4291	63.96238
1134.921	99.49239	32.38306	63.91292
1135.403	99.50074	32.33824	63.86301

1135.885	99.50865	32.29465	63.81279
1136.368	99.51743	32.25258	63.76261
1136.85	99.5278	32.21247	63.71295
1137.332	99.53955	32.17467	63.66416
1137.814	99.55151	32.13928	63.61631
1138.296	99.56202	32.1061	63.56914
1138.778	99.56989	32.07476	63.52214
1139.26	99.57475	32.04493	63.47478
1139.742	99.57738	32.01653	63.42664
1140.225	99.57925	31.98975	63.37754
1140.707	99.58187	31.96497	63.32753
1141.189	99.5859	31.94255	63.27672
1141.671	99.5907	31.9226	63.22522
1142.153	99.59447	31.90501	63.173
1142.635	99.59474	31.88954	63.11999
1143.117	99.58958	31.87604	63.06611
1143.599	99.57819	31.86461	63.01141
1144.082	99.5616	31.85562	62.95604
1144.564	99.54228	31.84956	62.90023
1145.046	99.52367	31.84681	62.84412
1145.528	99.50913	31.84744	62.78773
1146.01	99.50099	31.85117	62.73088
1146.492	99.50011	31.85752	62.67333
1146.974	99.50574	31.86604	62.61488
1147.457	99.51585	31.87656	62.55549
1147.939	99.52792	31.88919	62.49535
1148.421	99.53953	31.90429	62.4347
1148.903	99.54916	31.92217	62.37379
1149.385	99.55629	31.94295	62.31267
1149.867	99.56142	31.96649	62.25122
1150.349	99.56568	31.99249	62.1892
1150.831	99.57031	32.0207	62.12637
1151.313	99.57621	32.05112	62.06262
1151.796	99.58354	32.08402	61.99801
1152.278	99.59173	32.11982	61.93271
1152.76	99.59971	32.15886	61.86685
1153.242	99.60629	32.20124	61.80044
1153.724	99.6107	32.24675	61.73337
1154.206	99.61286	32.29499	61.6655
1154.688	99.61331	32.34566	61.59676
1155.17	99.61304	32.39866	61.5273
1155.653	99.61299	32.45423	61.45742
1156.135	99.61346	32.51276	61.38755
1156.617	99.61401	32.57461	61.31803

1157.099	99.6135	32.63988	61.24901
1157.581	99.61047	32.70837	61.18041
1158.063	99.60385	32.77973	61.11208
1158.545	99.5933	32.85363	61.04384
1159.027	99.57964	32.92999	60.97569
1159.51	99.56447	33.00902	60.9078
1159.992	99.54985	33.0911	60.84039
1160.474	99.5375	33.17657	60.77358
1160.956	99.52851	33.2655	60.70729
1161.438	99.52296	33.35765	60.64125
1161.92	99.52034	33.45257	60.57507
1162.402	99.51966	33.54981	60.50848
1162.885	99.52028	33.64914	60.44147
1163.367	99.52187	33.75059	60.37432
1163.849	99.5247	33.85436	60.30751
1164.331	99.52927	33.96068	60.24154
1164.813	99.53606	34.06956	60.17675
1165.295	99.54515	34.18078	60.11327
1165.777	99.5562	34.29395	60.05106
1166.259	99.56849	34.40874	59.99007
1166.741	99.5811	34.525	59.93037
1167.224	99.59334	34.64287	59.87222
1167.706	99.60474	34.76265	59.81594
1168.188	99.61508	34.8846	59.76186
1168.67	99.62438	35.00877	59.7101
1169.152	99.63243	35.13493	59.66063
1169.634	99.63902	35.26271	59.61323
1170.116	99.64368	35.39172	59.56776
1170.598	99.646	35.52176	59.52419
1171.081	99.64571	35.65291	59.48271
1171.563	99.64282	35.78535	59.44362
1172.045	99.63773	35.91928	59.4072
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1173.009	99.62363	36.19137	59.34273
1173.491	99.61636	36.32894	59.31448
1173.973	99.60991	36.46706	59.28874
1174.455	99.60474	36.60561	59.26553
1174.938	99.60102	36.7447	59.24509
1175.42	99.59859	36.88458	59.22773
1175.902	99.59712	37.02548	59.21372
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1178.313	99.58975	37.74149	59.19381
1178.795	99.58901	37.88584	59.19962
1179.277	99.59026	38.03079	59.20916
1179.759	99.59425	38.17654	59.22267
1180.241	99.60116	38.32307	59.24023
1180.723	99.61044	38.47015	59.2617
1181.205	99.62075	38.61747	59.28684
1181.687	99.63024	38.76478	59.31544
1182.169	99.63714	38.91206	59.34746
1182.652	99.64026	39.05956	59.38305
1183.134	99.63942	39.20765	59.42247
1183.616	99.63541	39.35664	59.46588
1184.098	99.62977	39.5066	59.51329
1184.58	99.62428	39.65732	59.56451
1185.062	99.62014	39.80837	59.61927
1185.544	99.61773	39.95937	59.67736
1186.026	99.61634	40.11006	59.73874
1186.509	99.61436	40.26045	59.80358
1186.991	99.61005	40.41071	59.87213
1187.473	99.60207	40.56101	59.94455
1187.955	99.5901	40.71139	60.02077
1188.437	99.57519	40.86168	60.10048
1188.919	99.55932	41.01158	60.18322
1189.401	99.545	41.16088	60.26863
1189.883	99.53448	41.3095	60.35654
1190.366	99.52912	41.45766	60.44701
1190.848	99.52906	41.60568	60.54031
1191.33	99.53336	41.75389	60.63663
1191.812	99.54035	41.90246	60.73602
1192.294	99.54827	42.0513	60.83828
1192.776	99.55566	42.20013	60.94304
1193.258	99.56163	42.34865	61.04994
1193.74	99.56585	42.49669	61.1588
1194.223	99.56833	42.64426	61.26965
1194.705	99.56915	42.79152	61.38269
1195.187	99.56829	42.93868	61.49813
1195.669	99.56567	43.08587	61.61607
1196.151	99.56128	43.23307	61.73643
1196.633	99.55537	43.38022	61.85898
1197.115	99.54849	43.52724	61.98349
1197.597	99.54158	43.67417	62.10982
1198.08	99.53558	43.82118	62.23799
1198.562	99.53128	43.96847	62.36809
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1199.526	99.5289	44.26421	62.6341
1200.008	99.53039	44.41243	62.76964
1200.49	99.533	44.56052	62.90642
1200.972	99.53632	44.7083	63.04413
1201.454	99.54014	44.85576	63.18258
1201.937	99.54441	45.00309	63.32182
1202.419	99.54922	45.1506	63.46202
1202.901	99.55472	45.29856	63.60337
1203.383	99.56091	45.44715	63.74598
1203.865	99.56783	45.59635	63.88985
1204.347	99.57542	45.74611	64.03493
1204.829	99.58369	45.89642	64.18122
1205.312	99.59255	46.04743	64.32883
1205.794	99.60176	46.19946	64.478
1206.276	99.61081	46.35285	64.62901
1206.758	99.61882	46.50787	64.78206
1207.24	99.62481	46.66454	64.93717
1207.722	99.62791	46.82269	65.09418
1208.204	99.62762	46.982	65.25286
1208.686	99.62418	47.1422	65.41304
1209.168	99.61846	47.30318	65.5747
1209.651	99.61179	47.46502	65.73801
1210.133	99.60551	47.62796	65.90319
1210.615	99.60048	47.79217	66.07039
1211.097	99.59693	47.9577	66.23961
1211.579	99.59446	48.12444	66.41063
1212.061	99.59235	48.29214	66.58311
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1213.025	99.58721	48.62995	66.93143
1213.508	99.58466	48.80023	67.10721
1213.99	99.58321	48.97178	67.2843
1214.472	99.58373	49.14488	67.46292
1214.954	99.58653	49.31961	67.64322
1215.436	99.59123	49.49583	67.82519
1215.918	99.59669	49.67325	68.0087
1216.4	99.60148	49.85154	68.19362
1216.882	99.60443	50.03052	68.37992
1217.365	99.60519	50.21017	68.56765
1217.847	99.60435	50.39065	68.75693
1218.329	99.60319	50.57217	68.94788
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1219.775	99.61223	51.12394	69.53031
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1220.74	99.63029	51.49723	69.92491
1221.222	99.63898	51.68533	70.12374
1221.704	99.64497	51.87444	70.32354
1222.186	99.6471	52.06454	70.52423
1222.668	99.64493	52.25553	70.72566
1223.15	99.63901	52.44722	70.92759
1223.632	99.6305	52.63937	71.12977
1224.114	99.62094	52.83183	71.33207
1224.596	99.6119	53.02456	71.53449
1225.079	99.60472	53.21766	71.73715
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1226.043	99.59924	53.60568	72.14377
1226.525	99.60123	53.80078	72.34778
1227.007	99.60582	53.99654	72.55202
1227.489	99.61211	54.19279	72.75621
1227.971	99.61904	54.38938	72.96011
1228.453	99.62563	54.58624	73.16358
1228.936	99.6311	54.7834	73.3666
1229.418	99.63516	54.98091	73.56922
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1231.346	99.64277	55.77319	74.3738
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1232.31	99.64805	56.16779	74.76903
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1237.132	99.65215	58.10773	76.62521
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1238.096	99.64078	58.48551	76.96656
1238.578	99.63731	58.67283	77.13405
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1244.364	99.60458	60.78238	78.94274
1244.846	99.59335	60.94552	79.07582
1245.328	99.58869	61.10692	79.2061
1245.81	99.59171	61.26655	79.3335
1246.292	99.60194	61.42422	79.45794
1246.774	99.61737	61.57969	79.57941
1247.256	99.63503	61.73275	79.69796
1247.738	99.65154	61.88323	79.81372
1248.22	99.66403	62.03112	79.92686
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1261.238	99.69263	65.10487	82.04975
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1262.202	99.71104	65.26092	82.15149
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1267.023	99.72314	65.89392	82.5733
1267.505	99.72682	65.94476	82.60859
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1268.47	99.73293	66.04132	82.6758
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1273.291	99.70976	66.42177	82.94255
1273.773	99.70535	66.45062	82.965
1274.255	99.70186	66.4779	82.98687
1274.737	99.70026	66.50367	83.0081
1275.219	99.70122	66.52806	83.02862
1275.702	99.70476	66.55125	83.04842
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1282.451	99.68823	66.77832	83.26229
1282.933	99.68772	66.78691	83.2741
1283.416	99.68571	66.79485	83.28556
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1284.862	99.68195	66.81677	83.31879
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1285.826	99.6897	66.83086	83.34045
1286.308	99.69571	66.83788	83.35126
1286.791	99.70165	66.84498	83.36216
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1288.719	99.71737	66.87592	83.40742
1289.201	99.72166	66.88439	83.41886
1289.683	99.72713	66.89302	83.43012
1290.165	99.7335	66.90168	83.44114
1290.647	99.74007	66.91032	83.45192
1291.13	99.74603	66.91889	83.4625
1291.612	99.7508	66.92736	83.47291
1292.094	99.75421	66.93569	83.48312
1292.576	99.75665	66.94384	83.4931
1293.058	99.75866	66.95175	83.50278
1293.54	99.76096	66.95939	83.51212
1294.022	99.7639	66.96677	83.52115
1294.504	99.76751	66.97398	83.52995
1294.987	99.77153	66.98113	83.53861
1295.469	99.77564	66.98836	83.54721
1295.951	99.77968	66.99577	83.55574
1296.433	99.78381	67.00342	83.56408
1296.915	99.7885	67.01134	83.57208
1297.397	99.79426	67.01953	83.57957
1297.879	99.80151	67.02798	83.58644
1298.361	99.81027	67.03672	83.59268
1298.844	99.82001	67.04576	83.59834
1299.326	99.82984	67.05508	83.60354
1299.808	99.83858	67.06463	83.60838
1300.29	99.84515	67.07434	83.61297
1300.772	99.84871	67.08412	83.61736
1301.254	99.84894	67.09392	83.6216
1301.736	99.84605	67.1038	83.62576
1302.219	99.84057	67.11386	83.62992
1302.701	99.8334	67.1243	83.63413
1303.183	99.82548	67.13528	83.63844
1303.665	99.81766	67.14694	83.64282
1304.147	99.81062	67.15934	83.64719
1304.629	99.80488	67.17247	83.65142
1305.111	99.8008	67.18626	83.65541

1305.593	99.79849	67.20065	83.6591
1306.075	99.7979	67.21562	83.66247
1306.558	99.79881	67.23115	83.66554
1307.04	99.80084	67.24725	83.66832
1307.522	99.80356	67.26394	83.67076
1308.004	99.80647	67.2812	83.67281
1308.486	99.8093	67.29906	83.6744
1308.968	99.81192	67.31754	83.6755
1309.45	99.81451	67.33672	83.67622
1309.932	99.8174	67.35673	83.67671
1310.415	99.82093	67.37768	83.67718
1310.897	99.82533	67.39965	83.67784
1311.379	99.83035	67.42264	83.67879
1311.861	99.83543	67.44657	83.68004
1312.343	99.83958	67.47129	83.6815
1312.825	99.8417	67.49662	83.68308
1313.307	99.84098	67.52244	83.68469
1313.789	99.83717	67.54866	83.68638
1314.272	99.83089	67.57527	83.68823
1314.754	99.82338	67.60228	83.6904
1315.236	99.81628	67.62972	83.69302
1315.718	99.81116	67.6576	83.69615
1316.2	99.80907	67.6859	83.69979
1316.682	99.81019	67.71464	83.70385
1317.164	99.81388	67.74384	83.70824
1317.646	99.81887	67.77355	83.71287
1318.129	99.82365	67.80383	83.71768
1318.611	99.82704	67.83469	83.72266
1319.093	99.82863	67.86611	83.72783
1319.575	99.82863	67.89799	83.73323
1320.057	99.828	67.9302	83.73894
1320.539	99.82787	67.96261	83.74507
1321.021	99.82904	67.99511	83.75176
1321.503	99.83186	68.02768	83.75915
1321.986	99.83591	68.06031	83.7674
1322.468	99.84025	68.09304	83.77657
1322.95	99.84351	68.12593	83.78669
1323.432	99.84444	68.15902	83.79774
1323.914	99.84212	68.19238	83.80966
1324.396	99.83623	68.22608	83.82242
1324.878	99.8271	68.26022	83.83598
1325.36	99.81567	68.29491	83.85026
1325.843	99.80335	68.33018	83.8651
1326.325	99.79169	68.36596	83.88017

1326.807	99.78203	68.40205	83.89491
1327.289	99.77538	68.43812	83.90865
1327.771	99.7722	68.47379	83.92066
1328.253	99.77235	68.50873	83.93036
1328.735	99.77522	68.54273	83.93741
1329.218	99.77998	68.57577	83.94182
1329.7	99.78574	68.60798	83.9439
1330.182	99.79179	68.63959	83.94416
1330.664	99.79767	68.67088	83.94315
1331.146	99.80307	68.70208	83.94145
1331.628	99.8076	68.73344	83.93953
1332.11	99.81088	68.76514	83.93781
1332.592	99.81237	68.79737	83.93663
1333.074	99.81161	68.83031	83.93631
1333.557	99.80839	68.86414	83.93711
1334.039	99.80304	68.89897	83.93918
1334.521	99.79643	68.93485	83.94261
1335.003	99.78988	68.97171	83.94736
1335.485	99.78476	69.00941	83.95331
1335.967	99.7821	69.04779	83.96033
1336.449	99.78236	69.08668	83.9683
1336.931	99.78515	69.12593	83.97719
1337.414	99.78944	69.1655	83.987
1337.896	99.79404	69.20534	83.99779
1338.378	99.79786	69.24544	84.00961
1338.86	99.80044	69.28577	84.02244
1339.342	99.8019	69.32627	84.03622
1339.824	99.80281	69.36688	84.05086
1340.306	99.80382	69.40752	84.06625
1340.788	99.80521	69.44816	84.08232
1341.271	99.8068	69.48877	84.09901
1341.753	99.80798	69.52937	84.11632
1342.235	99.80805	69.56994	84.13426
1342.717	99.80647	69.61049	84.15282
1343.199	99.80312	69.65105	84.17202
1343.681	99.7984	69.69163	84.19191
1344.163	99.79308	69.73227	84.21254
1344.646	99.78825	69.77299	84.23398
1345.128	99.78487	69.81384	84.25632
1345.61	99.78374	69.85479	84.27959
1346.092	99.78524	69.8958	84.3038
1346.574	99.78936	69.93677	84.32891
1347.056	99.7956	69.97761	84.35483
1347.538	99.80299	70.01822	84.38144

1348.02	99.8104	70.05855	84.4085
1348.502	99.81646	70.09854	84.43568
1348.985	99.8201	70.13813	84.46242
1349.467	99.82072	70.17719	84.48793
1349.949	99.81853	70.21554	84.51126
1350.431	99.81445	70.25294	84.53141
1350.913	99.81009	70.28916	84.5476
1351.395	99.80718	70.32413	84.55948
1351.877	99.80715	70.35791	84.56731
1352.359	99.81063	70.39079	84.5719
1352.842	99.81732	70.42316	84.57446
1353.324	99.82609	70.45547	84.57627
1353.806	99.83529	70.48805	84.57846
1354.288	99.84338	70.52115	84.58185
1354.77	99.8492	70.55481	84.58684
1355.252	99.85239	70.589	84.59352
1355.734	99.85326	70.62357	84.60174
1356.216	99.85243	70.6584	84.61124
1356.698	99.85064	70.69338	84.62175
1357.181	99.84821	70.72844	84.63307
1357.663	99.845	70.76356	84.64507
1358.145	99.84052	70.7987	84.65773
1358.627	99.83418	70.83384	84.67106
1359.109	99.82555	70.86892	84.68513
1359.591	99.81473	70.90391	84.7
1360.073	99.80247	70.93875	84.71573
1360.556	99.79006	70.97339	84.73227
1361.038	99.77924	71.0078	84.74942
1361.52	99.77179	71.04189	84.76684
1362.002	99.76914	71.0756	84.78406
1362.484	99.77192	71.10882	84.8006
1362.966	99.77962	71.14148	84.81613
1363.448	99.79073	71.17354	84.83052
1363.93	99.80314	71.20504	84.84391
1364.413	99.81477	71.23603	84.8566
1364.895	99.82397	71.26665	84.86893
1365.377	99.82989	71.29703	84.88121
1365.859	99.83212	71.32728	84.89367
1366.341	99.83076	71.35751	84.90642
1366.823	99.82613	71.38778	84.91953
1367.305	99.81862	71.41815	84.9331
1367.787	99.80862	71.44865	84.94727
1368.27	99.79662	71.47929	84.96225
1368.752	99.78334	71.51003	84.97825

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1371.162	99.73282	71.66305	85.07525
1371.644	99.73011	71.69313	85.09735
1372.126	99.72873	71.72302	85.11998
1372.609	99.72737	71.75276	85.14292
1373.091	99.72491	71.78232	85.16585
1373.573	99.72079	71.81162	85.18839
1374.055	99.71537	71.84054	85.2101
1374.537	99.7097	71.86895	85.23059
1375.019	99.70505	71.89676	85.24966
1375.501	99.70227	71.92398	85.26732
1375.984	99.70154	71.9507	85.28386
1376.466	99.70244	71.97709	85.29972
1376.948	99.70416	72.0033	85.31541
1377.43	99.70611	72.02944	85.33135
1377.912	99.70801	72.05554	85.34785
1378.394	99.71004	72.08159	85.36512
1378.876	99.71258	72.10754	85.38331
1379.358	99.71603	72.13336	85.40256
1379.841	99.72041	72.15903	85.42304
1380.323	99.72541	72.18461	85.44489
1380.805	99.73033	72.21014	85.46818
1381.287	99.73443	72.23562	85.49275
1381.769	99.73721	72.26098	85.51814
1382.251	99.73846	72.28605	85.5436
1382.733	99.73824	72.31062	85.56823
1383.215	99.7367	72.33449	85.59114
1383.698	99.73404	72.35753	85.61169
1384.18	99.73018	72.37974	85.62949
1384.662	99.72498	72.40119	85.64443
1385.144	99.71844	72.42202	85.65656
1385.626	99.71074	72.44237	85.66602
1386.108	99.70258	72.46233	85.67302
1386.59	99.6949	72.48193	85.67776
1387.072	99.68871	72.50116	85.68052
1387.554	99.68449	72.52003	85.68164
1388.037	99.68201	72.53861	85.68159
1388.519	99.6805	72.55706	85.68091
1389.001	99.67889	72.5756	85.68022
1389.483	99.67628	72.5945	85.68018
1389.965	99.67225	72.61402	85.68136

1390.447	99.66674	72.63433	85.68428
1390.929	99.66003	72.6555	85.68925
1391.411	99.65237	72.67748	85.69642
1391.894	99.64392	72.70009	85.70564
1392.376	99.63476	72.72306	85.71657
1392.858	99.62486	72.7461	85.72873
1393.34	99.61466	72.76893	85.74166
1393.822	99.60477	72.79139	85.75503
1394.304	99.59615	72.81343	85.7688
1394.786	99.58967	72.83511	85.78314
1395.269	99.58561	72.85656	85.79833
1395.751	99.58353	72.87795	85.81468
1396.233	99.58236	72.89939	85.83231
1396.715	99.58099	72.92096	85.85111
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1397.679	99.57583	72.96432	85.89065
1398.161	99.57323	72.9859	85.91029
1398.643	99.57259	73.00729	85.92929
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1404.429	99.59785	73.26564	86.23075
1404.911	99.58786	73.28877	86.26608
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1405.875	99.57689	73.33458	86.33184
1406.357	99.57513	73.35654	86.35952
1406.839	99.57418	73.37741	86.38206
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1408.768	99.56008	73.44855	86.41532
1409.25	99.5545	73.46407	86.41254
1409.732	99.54971	73.47909	86.40728
1410.214	99.54642	73.49369	86.40037
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1412.625	99.53209	73.56355	86.36001
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1413.589	99.50764	73.59272	86.34813
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1414.553	99.46784	73.62369	86.34189
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1416	99.38652	73.67195	86.34385
1416.482	99.35579	73.68802	86.34692
1416.964	99.3249	73.70396	86.3509
1417.446	99.29577	73.71976	86.35572
1417.928	99.27116	73.73545	86.36142
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1419.857	99.26631	73.79725	86.3956
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1420.821	99.31055	73.82818	86.42215
1421.303	99.33504	73.84393	86.43872
1421.785	99.35902	73.85999	86.45795
1422.267	99.38206	73.87642	86.48016
1422.75	99.40427	73.89322	86.50548
1423.232	99.42573	73.91029	86.53375
1423.714	99.44655	73.92748	86.56435
1424.196	99.46655	73.9445	86.59621
1424.678	99.4854	73.96107	86.62803
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1426.125	99.53168	74.00675	86.7151
1426.607	99.54265	74.02088	86.74102
1427.089	99.55103	74.03474	86.7659
1427.571	99.55688	74.04844	86.78992
1428.053	99.56073	74.06197	86.81297
1428.535	99.56363	74.07521	86.8346
1429.017	99.56709	74.08793	86.85411
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1430.946	99.60631	74.12966	86.89836
1431.428	99.61922	74.13799	86.90162
1431.91	99.62933	74.14612	86.90405
1432.392	99.63464	74.15447	86.90723



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1433.838	99.61717	74.18243	86.93025
1434.321	99.60307	74.19255	86.94251
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1435.285	99.57392	74.213	86.96965
1435.767	99.56403	74.22307	86.98272
1436.249	99.56032	74.23298	86.99466
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1439.142	99.62966	74.29365	87.0617
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1448.302	99.64948	74.44957	87.23876
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1449.266	99.65172	74.44102	87.17057
1449.749	99.65231	74.43724	87.13688
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1452.159	99.62393	74.44086	87.03036
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1458.427	99.49188	74.55838	87.02239
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1459.873	99.54662	74.60861	87.0827
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1460.837	99.57351	74.6419	87.12319
1461.32	99.58143	74.65755	87.14136
1461.802	99.58463	74.6725	87.1581
1462.284	99.5829	74.68691	87.17376
1462.766	99.57697	74.70096	87.18875
1463.248	99.56863	74.7148	87.20333
1463.73	99.56052	74.72844	87.21751
1464.212	99.55541	74.74181	87.23112
1464.694	99.55517	74.75482	87.24392
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1466.623	99.57848	74.80135	87.28285
1467.105	99.57823	74.81109	87.28785
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1468.069	99.56236	74.82675	87.2866
1468.552	99.54758	74.83213	87.27842
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1469.516	99.50704	74.83826	87.2469
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1470.48	99.45413	74.84179	87.20548
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1471.444	99.39449	74.84778	87.16934
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1472.891	99.32294	74.86759	87.14335
1473.373	99.30763	74.8775	87.14273
1473.855	99.29458	74.8889	87.14495
1474.337	99.28204	74.90154	87.14859
1474.819	99.26891	74.91507	87.15188

1475.301	99.25497	74.92903	87.15283
1475.783	99.24026	74.94297	87.14948
1476.265	99.22463	74.95643	87.14009
1476.748	99.20728	74.96906	87.12332
1477.23	99.18672	74.98068	87.09827
1477.712	99.16122	74.99124	87.06455
1478.194	99.12917	75.00083	87.02229
1478.676	99.0895	75.00963	86.97223
1479.158	99.04157	75.01791	86.9157
1479.64	98.98517	75.02596	86.85456
1480.122	98.92006	75.03407	86.79091
1480.604	98.84593	75.04247	86.72682
1481.087	98.76231	75.05129	86.66411
1481.569	98.66864	75.06056	86.60412
1482.051	98.56453	75.07013	86.54765
1482.533	98.44971	75.07976	86.49491
1483.015	98.3239	75.08903	86.4456
1483.497	98.18672	75.09751	86.39909
1483.979	98.03765	75.10482	86.35468
1484.461	97.87625	75.1108	86.31198
1484.944	97.70281	75.11554	86.27117
1485.426	97.51918	75.11933	86.2329
1485.908	97.3297	75.12255	86.19807
1486.39	97.14161	75.12549	86.16757
1486.872	96.96518	75.12832	86.14207
1487.354	96.81275	75.13108	86.12211
1487.836	96.69769	75.13376	86.10821
1488.319	96.63261	75.1364	86.10103
1488.801	96.62759	75.13912	86.10135
1489.283	96.68749	75.1421	86.11007
1489.765	96.80943	75.14558	86.12808
1490.247	96.98172	75.14983	86.15609
1490.729	97.18613	75.15507	86.19454
1491.211	97.40298	75.1615	86.24363
1491.693	97.61613	75.16935	86.30331
1492.176	97.81604	75.17886	86.37338
1492.658	97.99918	75.1903	86.45351
1493.14	98.16624	75.20382	86.54299
1493.622	98.31984	75.21926	86.64039
1494.104	98.46281	75.23587	86.74308
1494.586	98.59717	75.25227	86.84716
1495.068	98.7236	75.26685	86.94835
1495.55	98.84147	75.27837	87.04315
1496.032	98.94917	75.28634	87.12957

1496.515	99.04515	75.29098	87.20689
1496.997	99.12876	75.2929	87.27514
1497.479	99.20077	75.2928	87.33449
1497.961	99.26308	75.29131	87.38503
1498.443	99.31811	75.28884	87.42669
1498.925	99.36803	75.28561	87.45922
1499.407	99.41434	75.28163	87.48239
1499.89	99.4575	75.27687	87.49609
1500.372	99.49711	75.27131	87.50054
1500.854	99.532	75.26505	87.49648
1501.336	99.56066	75.25834	87.4853
1501.818	99.58163	75.2516	87.46903
1502.3	99.59379	75.24529	87.4502
1502.782	99.59664	75.23987	87.43136
1503.264	99.59018	75.23564	87.4146
1503.747	99.57492	75.23268	87.4011
1504.229	99.55206	75.23087	87.39102
1504.711	99.5238	75.22998	87.38374
1505.193	99.49402	75.22978	87.37835
1505.675	99.46887	75.23009	87.37404
1506.157	99.45624	75.2308	87.37035
1506.639	99.46236	75.23186	87.36716
1507.121	99.48768	75.23324	87.36451
1507.604	99.52628	75.23492	87.36243
1508.086	99.56975	75.23685	87.36076
1508.568	99.61131	75.23897	87.35902
1509.05	99.64721	75.24111	87.35639
1509.532	99.67601	75.24312	87.35202
1510.014	99.69772	75.24485	87.34548
1510.496	99.71296	75.24627	87.33707
1510.979	99.72279	75.24749	87.3278
1511.46	99.72859	75.24872	87.31912
1511.943	99.73158	75.25026	87.31252
1512.425	99.73271	75.25239	87.30926
1512.907	99.73218	75.25538	87.31015
1513.389	99.72958	75.25939	87.31547
1513.871	99.72405	75.26452	87.32503
1514.353	99.7149	75.27076	87.33822
1514.835	99.70197	75.27802	87.35423
1515.318	99.68616	75.28616	87.37211
1515.8	99.66955	75.29494	87.39076
1516.282	99.65488	75.30396	87.40893
1516.764	99.64458	75.31264	87.42509
1517.246	99.63963	75.32018	87.43749

1517.728	99.63914	75.32564	87.44439
1518.21	99.64111	75.32827	87.44459
1518.692	99.64333	75.3279	87.43827
1519.175	99.64457	75.32517	87.42734
1519.657	99.64485	75.32138	87.41493
1520.139	99.64545	75.31787	87.404
1520.621	99.64822	75.31545	87.39621
1521.103	99.65434	75.3143	87.39171
1521.585	99.66326	75.31412	87.38964
1522.067	99.67249	75.31445	87.38907
1522.549	99.67886	75.31501	87.3896
1523.031	99.68025	75.31576	87.39156
1523.514	99.67629	75.31689	87.39585
1523.996	99.66831	75.31875	87.40361
1524.478	99.6587	75.32172	87.41593
1524.96	99.65045	75.32611	87.43369
1525.442	99.64637	75.3321	87.4573
1525.924	99.64835	75.3396	87.48658
1526.406	99.65657	75.34828	87.52056
1526.888	99.66963	75.3575	87.55726
1527.371	99.68502	75.3664	87.59376
1527.853	99.70004	75.37411	87.62669
1528.335	99.71241	75.37996	87.65304
1528.817	99.7206	75.38364	87.67113
1529.299	99.72385	75.3852	87.68086
1529.781	99.72205	75.38492	87.68331
1530.263	99.71559	75.38309	87.67999
1530.746	99.70546	75.37993	87.67215
1531.228	99.69312	75.3755	87.66037
1531.71	99.68079	75.36974	87.64452
1532.192	99.6712	75.36246	87.6239
1532.674	99.66715	75.35349	87.59779
1533.156	99.67051	75.34276	87.56599
1533.638	99.68094	75.33047	87.52936
1534.12	99.69559	75.31709	87.48978
1534.603	99.71049	75.30327	87.44972
1535.085	99.72237	75.28967	87.41144
1535.567	99.72946	75.27689	87.37659
1536.049	99.73135	75.26531	87.34598
1536.531	99.72844	75.25513	87.31964
1537.013	99.72118	75.24636	87.29701
1537.495	99.70991	75.23881	87.27722
1537.977	99.69473	75.23226	87.25946
1538.459	99.67586	75.22654	87.24332

1538.942	99.65427	75.22163	87.22901
1539.424	99.63239	75.21764	87.21726
1539.906	99.61397	75.2148	87.20912
1540.388	99.60246	75.21331	87.20562
1540.87	99.59937	75.21323	87.2075
1541.352	99.60345	75.21449	87.21502
1541.834	99.61176	75.21684	87.22786
1542.316	99.62116	75.21992	87.24524
1542.799	99.6295	75.22334	87.2661
1543.281	99.63625	75.22681	87.28934
1543.763	99.64231	75.23012	87.31409
1544.245	99.64957	75.2332	87.33983
1544.727	99.65982	75.23611	87.36656
1545.209	99.67386	75.23904	87.39476
1545.691	99.69078	75.24222	87.42499
1546.174	99.70827	75.24568	87.45691
1546.656	99.72337	75.24904	87.48833
1547.138	99.73354	75.25159	87.51566
1547.62	99.73735	75.25268	87.53585
1548.102	99.73465	75.25207	87.54792
1548.584	99.72678	75.24984	87.55263
1549.066	99.71626	75.24614	87.55139
1549.548	99.70615	75.24104	87.54528
1550.031	99.69887	75.23447	87.53471
1550.513	99.69558	75.22629	87.51941
1550.995	99.69582	75.2164	87.49875
1551.477	99.69825	75.20481	87.47228
1551.959	99.70146	75.19176	87.44026
1552.441	99.70448	75.17766	87.40388
1552.923	99.70702	75.163	87.36504
1553.405	99.70911	75.14818	87.32581
1553.887	99.71069	75.13353	87.28788
1554.37	99.71116	75.11924	87.25248
1554.852	99.70924	75.10549	87.22033
1555.334	99.70324	75.0924	87.19183
1555.816	99.69145	75.08005	87.16712
1556.298	99.67258	75.06846	87.14613
1556.78	99.64619	75.05754	87.12861
1557.262	99.61375	75.04722	87.11417
1557.744	99.58005	75.03742	87.10244
1558.227	99.55435	75.02822	87.09323
1558.709	99.548	75.01979	87.08659
1559.191	99.56656	75.01235	87.08278
1559.673	99.60394	75.00608	87.08209

1560.155	99.64718	75.00104	87.08475
1560.637	99.68575	74.99714	87.09085
1561.119	99.71489	74.99426	87.10051
1561.602	99.73405	74.99233	87.11396
1562.083	99.74451	74.99137	87.13161
1562.566	99.74814	74.99153	87.15386
1563.048	99.74712	74.9929	87.18075
1563.53	99.74383	74.99538	87.21164
1564.012	99.74073	74.99857	87.24513
1564.494	99.7401	75.00179	87.27942
1564.976	99.74327	75.00432	87.31282
1565.458	99.75031	75.00567	87.34421
1565.941	99.76009	75.00566	87.37322
1566.423	99.77082	75.00443	87.40011
1566.905	99.7807	75.00232	87.42551
1567.387	99.78854	74.99968	87.45007
1567.869	99.79388	74.99674	87.47407
1568.351	99.79714	74.99345	87.49712
1568.833	99.79941	74.98949	87.51801
1569.315	99.80196	74.98432	87.53471
1569.798	99.80579	74.97729	87.54463
1570.28	99.81102	74.96787	87.54536
1570.762	99.81712	74.95595	87.53592
1571.244	99.82337	74.94206	87.51799
1571.726	99.82917	74.92725	87.49573
1572.208	99.83438	74.91267	87.47383
1572.69	99.83909	74.89906	87.45547
1573.172	99.84364	74.88674	87.44185
1573.655	99.84836	74.87575	87.43289
1574.137	99.85362	74.86606	87.4279
1574.619	99.85991	74.8576	87.42606
1575.101	99.86781	74.85025	87.4266
1575.583	99.87808	74.84383	87.4289
1576.065	99.89121	74.8381	87.43255
1576.547	99.90722	74.8328	87.43739
1577.03	99.9253	74.82774	87.44346
1577.511	99.94426	74.82282	87.45094
1577.994	99.96286	74.81806	87.45995
1578.476	99.9802	74.81352	87.47044
1578.958	99.9958	74.80919	87.48201
1579.44	100.0096	74.80495	87.49394
1579.922	100.0217	74.80055	87.50528
1580.404	100.0327	74.79567	87.51505
1580.886	100.0431	74.79004	87.5225

1581.369	100.0532	74.7836	87.5274
1581.851	100.0631	74.77653	87.53018
1582.333	100.0722	74.76924	87.53181
1582.815	100.0795	74.76215	87.5334
1583.297	100.0838	74.7556	87.53588
1583.779	100.084	74.74971	87.5397
1584.261	100.0795	74.74446	87.54485
1584.743	100.0707	74.7397	87.55096
1585.226	100.0588	74.73528	87.55745
1585.708	100.0458	74.73105	87.56357
1586.19	100.0341	74.72681	87.56841
1586.672	100.0256	74.72229	87.57103
1587.154	100.0219	74.71712	87.5705
1587.636	100.0233	74.71092	87.56619
1588.118	100.0298	74.70342	87.55803
1588.6	100.0404	74.6946	87.54664
1589.083	100.0537	74.68479	87.53324
1589.565	100.0683	74.67455	87.5192
1590.047	100.083	74.66443	87.50568
1590.529	100.0973	74.65488	87.4934
1591.011	100.1106	74.64613	87.48267
1591.493	100.1229	74.63825	87.47347
1591.975	100.1339	74.63118	87.46559
1592.458	100.1436	74.62482	87.45876
1592.939	100.1516	74.61914	87.45269
1593.422	100.1578	74.61419	87.4472
1593.904	100.1621	74.61007	87.44216
1594.386	100.1647	74.60687	87.43747
1594.868	100.1661	74.60464	87.43302
1595.35	100.1668	74.60331	87.42864
1595.832	100.1673	74.60279	87.42413
1596.314	100.1681	74.60301	87.41933
1596.797	100.1695	74.60399	87.41414
1597.279	100.172	74.60583	87.40862
1597.761	100.1755	74.60871	87.40294
1598.243	100.1802	74.61275	87.39733
1598.725	100.1861	74.61797	87.39208
1599.207	100.1927	74.62432	87.38743
1599.689	100.1996	74.6317	87.38364
1600.171	100.2063	74.64007	87.38092
1600.654	100.2124	74.64949	87.37955
1601.136	100.2176	74.66013	87.37979
1601.618	100.2224	74.6722	87.38188
1602.1	100.2275	74.68583	87.38596



1602.582	100.2336	74.70094	87.39199
1603.064	100.2414	74.71724	87.39962
1603.546	100.2508	74.7342	87.40809
1604.028	100.2613	74.75124	87.41624
1604.51	100.2718	74.76789	87.42271
1604.993	100.2814	74.78404	87.42628
1605.475	100.2894	74.79991	87.42627
1605.957	100.2958	74.81593	87.42271
1606.439	100.301	74.8326	87.41618
1606.921	100.3057	74.85031	87.40765
1607.403	100.3106	74.86935	87.39826
1607.885	100.3158	74.88996	87.38914
1608.367	100.3213	74.91234	87.38135
1608.85	100.3267	74.9367	87.3757
1609.332	100.3317	74.96316	87.37269
1609.814	100.3363	74.99168	87.37234
1610.296	100.3411	75.022	87.37418
1610.778	100.3465	75.05365	87.37732
1611.26	100.3527	75.08611	87.38073
1611.742	100.3589	75.11896	87.38361
1612.225	100.364	75.15204	87.38558
1612.707	100.3661	75.18548	87.38682
1613.189	100.3638	75.21958	87.38784
1613.671	100.356	75.25462	87.38933
1614.153	100.3427	75.29079	87.39182
1614.635	100.3255	75.32808	87.39562
1615.117	100.3074	75.36635	87.40076
1615.599	100.2928	75.40544	87.40706
1616.082	100.2867	75.44529	87.41428
1616.564	100.2923	75.48595	87.42231
1617.046	100.3094	75.52756	87.43121
1617.528	100.3342	75.57027	87.44123
1618.01	100.3614	75.61418	87.45274
1618.492	100.3864	75.65926	87.46613
1618.974	100.4063	75.7055	87.48179
1619.456	100.4196	75.75287	87.50013
1619.938	100.4259	75.80149	87.52157
1620.421	100.425	75.85149	87.54655
1620.903	100.4173	75.90304	87.57551
1621.385	100.4035	75.95619	87.60876
1621.867	100.3853	76.01079	87.64633
1622.349	100.3654	76.06644	87.68775
1622.831	100.3473	76.12256	87.73184
1623.313	100.3343	76.17846	87.77676

1623.796	100.3281	76.23357	87.82035
1624.278	100.3286	76.28748	87.86084
1624.76	100.3337	76.33998	87.89729
1625.242	100.3404	76.39082	87.92958
1625.724	100.3461	76.43972	87.95804
1626.206	100.3483	76.48628	87.98307
1626.688	100.346	76.53015	88.00491
1627.17	100.339	76.57116	88.02362
1627.653	100.3283	76.60944	88.03922
1628.135	100.3155	76.64551	88.05197
1628.617	100.303	76.68014	88.06258
1629.099	100.2925	76.7141	88.07229
1629.581	100.2848	76.7479	88.08263
1630.063	100.2798	76.78163	88.09506
1630.545	100.2762	76.81507	88.11071
1631.027	100.2721	76.84785	88.13022
1631.51	100.2654	76.87966	88.15388
1631.992	100.2538	76.9103	88.18161
1632.474	100.2358	76.93962	88.21299
1632.956	100.2105	76.96742	88.24719
1633.438	100.1781	76.99328	88.28288
1633.92	100.1407	77.01649	88.31821
1634.402	100.1027	77.03616	88.35101
1634.885	100.0702	77.05146	88.37922
1635.366	100.0493	77.06198	88.40157
1635.849	100.0433	77.06779	88.41789
1636.331	100.0501	77.06934	88.42909
1636.813	100.0639	77.06714	88.43664
1637.295	100.0783	77.06157	88.44215
1637.777	100.0896	77.05284	88.44706
1638.259	100.0967	77.04109	88.45264
1638.741	100.1005	77.02653	88.46004
1639.224	100.1029	77.00965	88.47039
1639.706	100.106	76.99122	88.48453
1640.188	100.1109	76.97206	88.50236
1640.67	100.1179	76.95256	88.52204
1641.152	100.126	76.9321	88.53994
1641.634	100.1332	76.90919	88.55229
1642.116	100.1375	76.88223	88.5571
1642.598	100.1366	76.85034	88.55456
1643.081	100.1293	76.81341	88.54623
1643.563	100.1144	76.77192	88.53408
1644.045	100.0919	76.72654	88.51987
1644.527	100.0625	76.67786	88.50481

1645.009	100.0278	76.62619	88.4895
1645.491	99.99094	76.57156	88.47389
1645.973	99.95598	76.51375	88.4574
1646.455	99.92742	76.45249	88.43917
1646.938	99.90853	76.38767	88.41853
1647.42	99.89985	76.31952	88.39543
1647.902	99.89899	76.24859	88.37084
1648.384	99.90207	76.17557	88.34661
1648.866	99.9052	76.10109	88.32479
1649.348	99.90536	76.02551	88.3069
1649.83	99.90018	75.94893	88.29355
1650.313	99.88743	75.87128	88.28449
1650.794	99.86462	75.79247	88.27902
1651.277	99.82898	75.71248	88.27639
1651.759	99.77894	75.63135	88.27611
1652.241	99.71751	75.54916	88.27812
1652.723	99.65592	75.46587	88.2827
1653.205	99.61124	75.38138	88.29034
1653.687	99.59511	75.29556	88.30157
1654.169	99.60558	75.2084	88.31685
1654.652	99.63199	75.12008	88.33643
1655.134	99.66389	75.03098	88.3602
1655.616	99.69462	74.94152	88.38763
1656.098	99.72105	74.85201	88.41756
1656.58	99.74208	74.76239	88.44816
1657.062	99.75773	74.6721	88.477
1657.544	99.76851	74.58019	88.50141
1658.026	99.77523	74.48559	88.51908
1658.509	99.77877	74.38759	88.52874
1658.991	99.77996	74.28608	88.53063
1659.473	99.77951	74.18161	88.52643
1659.955	99.77822	74.07501	88.51869
1660.437	99.77693	73.96715	88.51004
1660.919	99.77672	73.85869	88.50252
1661.401	99.77879	73.75009	88.49726
1661.883	99.78416	73.64164	88.49436
1662.365	99.79295	73.53346	88.49283
1662.848	99.804	73.42547	88.49055
1663.33	99.81492	73.31727	88.48451
1663.812	99.82294	73.20809	88.47117
1664.294	99.82581	73.09672	88.44725
1664.776	99.82239	72.98178	88.41068
1665.258	99.81261	72.86219	88.36195
1665.74	99.79702	72.73792	88.3045

1666.222	99.77669	72.61019	88.24346
1666.705	99.75277	72.48085	88.18333
1667.187	99.72666	72.35159	88.12683
1667.669	99.70007	72.22344	88.07506
1668.151	99.67516	72.09681	88.02811
1668.633	99.65447	71.97157	87.98561
1669.115	99.6405	71.8474	87.94714
1669.597	99.63495	71.72399	87.9124
1670.08	99.63791	71.60129	87.88119
1670.562	99.64777	71.47955	87.85326
1671.044	99.6616	71.35918	87.82781
1671.526	99.67638	71.24038	87.80311
1672.008	99.6896	71.12272	87.77633
1672.49	99.69976	71.00509	87.74436
1672.972	99.7062	70.88607	87.7049
1673.454	99.70901	70.76454	87.65724
1673.937	99.7087	70.64002	87.60211
1674.419	99.70612	70.51277	87.54119
1674.901	99.70217	70.38352	87.47663
1675.383	99.69767	70.25325	87.41064
1675.865	99.6933	70.1229	87.34512
1676.347	99.68948	69.99318	87.28144
1676.829	99.68671	69.86453	87.22028
1677.311	99.68551	69.73716	87.16176
1677.793	99.68639	69.6112	87.10561
1678.276	99.68965	69.48677	87.05141
1678.758	99.69475	69.36399	86.99868
1679.24	99.70013	69.24285	86.94694
1679.722	99.70318	69.12314	86.89572
1680.204	99.70065	69.0044	86.84461
1680.686	99.68928	68.88604	86.79341
1681.168	99.66685	68.76754	86.74229
1681.65	99.63236	68.64875	86.69194
1682.133	99.58691	68.53002	86.64348
1682.615	99.53463	68.41213	86.59798
1683.097	99.48402	68.29593	86.55601
1683.579	99.44776	68.18188	86.51721
1684.061	99.43795	68.06986	86.48044
1684.543	99.45816	67.95926	86.44438
1685.025	99.50032	67.84937	86.40795
1685.508	99.55067	67.73966	86.37057
1685.99	99.59781	67.62994	86.33207
1686.472	99.63575	67.52034	86.29261
1686.954	99.66304	67.4112	86.25251

1687.436	99.68073	67.30284	86.21192
1687.918	99.69086	67.19531	86.17054
1688.4	99.69582	67.08821	86.12752
1688.882	99.69774	66.98103	86.08204
1689.365	99.6982	66.87345	86.03391
1689.847	99.6982	66.76563	85.98376
1690.329	99.69793	66.65806	85.93263
1690.811	99.69724	66.55129	85.88159
1691.293	99.69585	66.44571	85.83147
1691.775	99.69371	66.34151	85.78275
1692.257	99.69097	66.23863	85.73547

EQE data of the PSCs based on SnO<sub>2</sub> and SSO ETL