La Cascade Ion Distribution Results

January 4, 2024

No. Electrons	Charge state	Relative Ion Occupation					
		Experiment*	Model A	Model B	Model C	Model D	Model E
53	4+	0.04	3.46E-2	5.41E-3	5.41E-3	5.41E-3	5.41E-3
52	5+	0.1	4.72E-1	3.01E-1	1.36E-1	1.36E-1	1.36E-1
51	6+	0.28	4.66E-1	6.42E-1	5.96E-1	4.18E-9	1.38E-7
50	7+	0.35	2.65E-2	5.05E-2	2.61E-1	8.51e-1	8.48E-1
49	8+	0.17	1.12E-4	2.93E-4	3.42E-3	7.25E-3	1.03E-2
48	9+	0.04	1.23E-8	3.01E-8	7.00E-7	1.04E-6	6.03E-7

*Approximate values are considered from the plot at around 900 eV

- We have considered all the ionic states from La^{2+} to La^{10+} for cascade calculation. Only for comparison purposes, we have shown the La^{4+} to La^{9+} in the above table.
- Considering Average Single Configuration Approach, a total of 68241 blocks are generated for all these ionic states of La (La^{2+} to La^{10+}).
- 138504 steps are generated between all these blocks. Among these 51997 Autoionization and 86507 Radiative emissions steps.
- For each Autoionization step, we have considered up to 5000 lines, and 3000 lines for each Radiative emission step.
- Model A is without any shift in energies.
- Model B is with the energy shifts as per the NIST energies.
- Model C is with the energy shifts as -4.2 for levels with 50 electrons.
- Model D is with the energy shifts as -4.25 for levels with 50 electrons.
- Model E is the same as model D but we selected lines randomly in autoionization and radiative emissions.