Assignment 1: Figures and tables

Question 1: The "Living" Ice

Table 1: Computed values from Lineweaver-Burk plot

S_2	$K_m/V_{\max}$	$1/V\max$	$-1/K_{m1}$	R^2	$V\max$	K_{m1}
0.05	0.1000	3.0000	-30.0000	1.0000	0.3333	0.0333
0.1	0.1000	2.0000	-20.0000	1.0000	0.5000	0.0500
0.2	0.1000	1.5000	-15.0000	1.0000	0.6667	0.0667
0.5	0.1000	1.2000	-12.0000	1.0000	0.8333	0.0833
1.0	0.1000	1.1000	-11.0000	1.0000	0.9091	0.0909
10000.0	0.1000	1.0000	-10.0001	1.0000	1.0000	0.1000

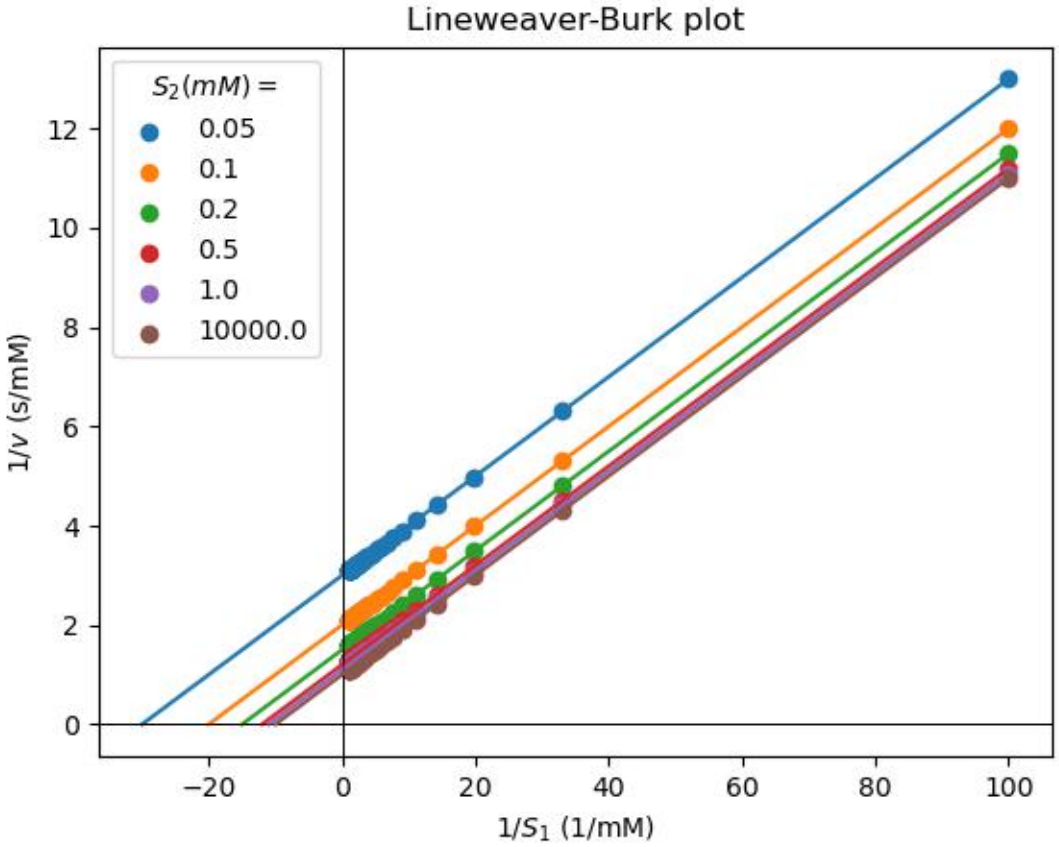

Figure 1: Lineweaver-Burk plot

From the rearranged equation we derive:

$$K_{m2} = 0.1000 \pm 1.122 \times 10^{-11}$$

Table 2: Computed values from Eadie-Hofstee plot

S_2	$-K_m$	$1/V\max$	R^2
0.05	0.0333	0.3333	1.0000
0.1	0.0500	0.5000	1.0000
0.2	0.0667	0.6667	1.0000
0.5	0.0833	0.8333	1.0000
1.0	0.0909	0.9091	1.0000
10000.0	0.1000	1.0000	1.0000

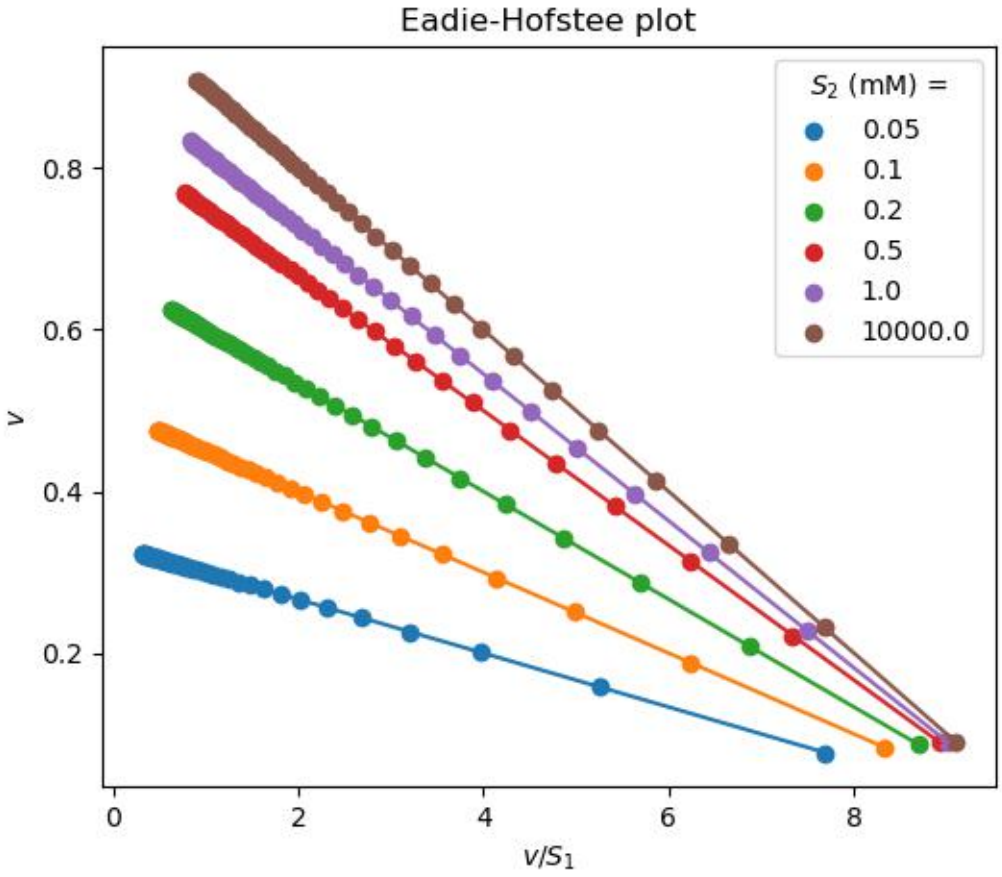

Figure 2: Eadie-Hostee plot

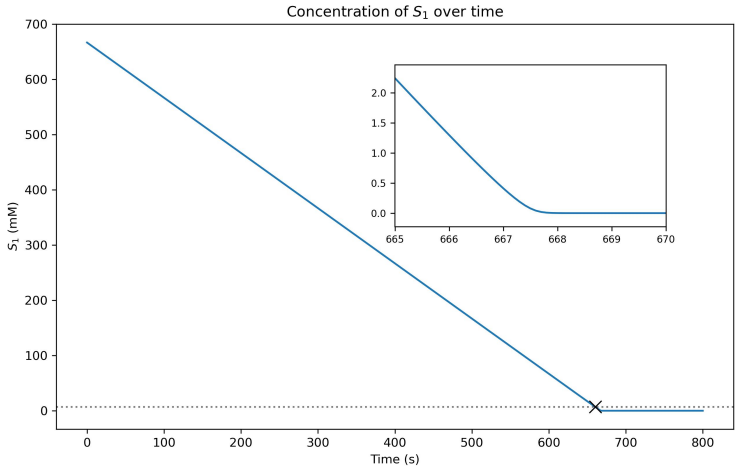

Figure 3: Concentration of S_1 over time

It took 660.29 seconds (11.0 minutes) to reach a concentration below 1 g/L.

Question 2: The Case of the Possible Biomass

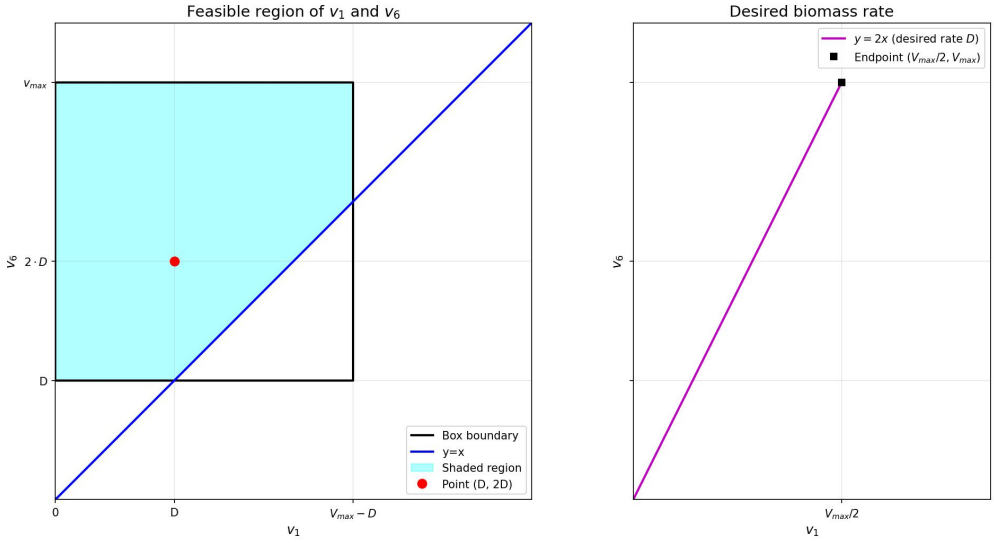

Figure 4: Left: Feasible region of v_1 vs v_6. Right: Dependence of exact solution $v_6 = 2v_1$ on D