Table S1. Second central composite design (CCD): regression coefficients (RC), standard errors (SE), *t* values, p-values and ANOVA for the responses of biomass concentration, specific carotenoid (SC) mass fraction and volumetric carotenoid (VC) concentration

	γ(biomass)/(g/L)				w_{SC}/(μg/g)					γ_{VC}/(μg/L)			
	RC	SE	*t*(3)	p		RC	SE	*t*(3)	p		RC	SE	*t*(3)	p
Mean*	6.88	0.12	57.17	<0.01	Mean*	154.85	4.10	37.71	<0.01	Mean*	1067.71	44.92	23.76	<0.01
X_1(L)*	0.69	0.31	4.37	<0.01	X_1(L)	4.25	10.86	0.78	0.49	X_1(L)**	151.50	118.85	2.54	0.083
X_2(L)*	0.91	0.31	5.72	<0.01	X_2(L)*	18.75	10.86	3.45	<0.01	X_2(L)*	235.50	118.85	3.96	0.028
X_1X_2	-0.23	0.31	-1.45	0.24	X_1X_2	0.75	10.86	0.13	0.89	X_1X_2	12.00	118.85	0.20	0.85

Source of variation	Degree of freedom			Quadratic sum			Quadratic mean			Calculated F-value		
	γ_{VC}/(μg/L)	w_{SC}/(μg/g)	γ(biomass)/(g/L)	γ_{VC}/(μg/L)	w_{SC}/(μg/g)	γ(biomass)/(g/L)	γ_{VC}/(μg/L)	w_{SC}/(μg/g)	γ(biomass)/(g/L)	γ_{VC}/(μg/L)	w_{SC}/(μg/g)	γ(biomass)/(g/L)
Regression	2	1	2	3136650.2	1406.2	5.2	156825.4	1406.25	2.6	14.6	16.40	20.2
Residue	4	5	4	42957.4	428.6	0.5	10739.3	85.72	0.1			
Total	6	6	6	356607.4	1843.8	5.7						

*p≤0.05, **p≤0.1, X_1=sugar cane molasses concentration, X_2=corn steep liquor concentration, CCD results: volumetric concentration of carotenoids R=0.93, $F_{2;\,4;\,0.90}$=4.32, specific mass fraction of carotenoids R=0.87, $F_{1;\,5;\,0.95}$=6.61, biomass concentration R=0.96, $F_{2;\,4;\,0.95}$=6