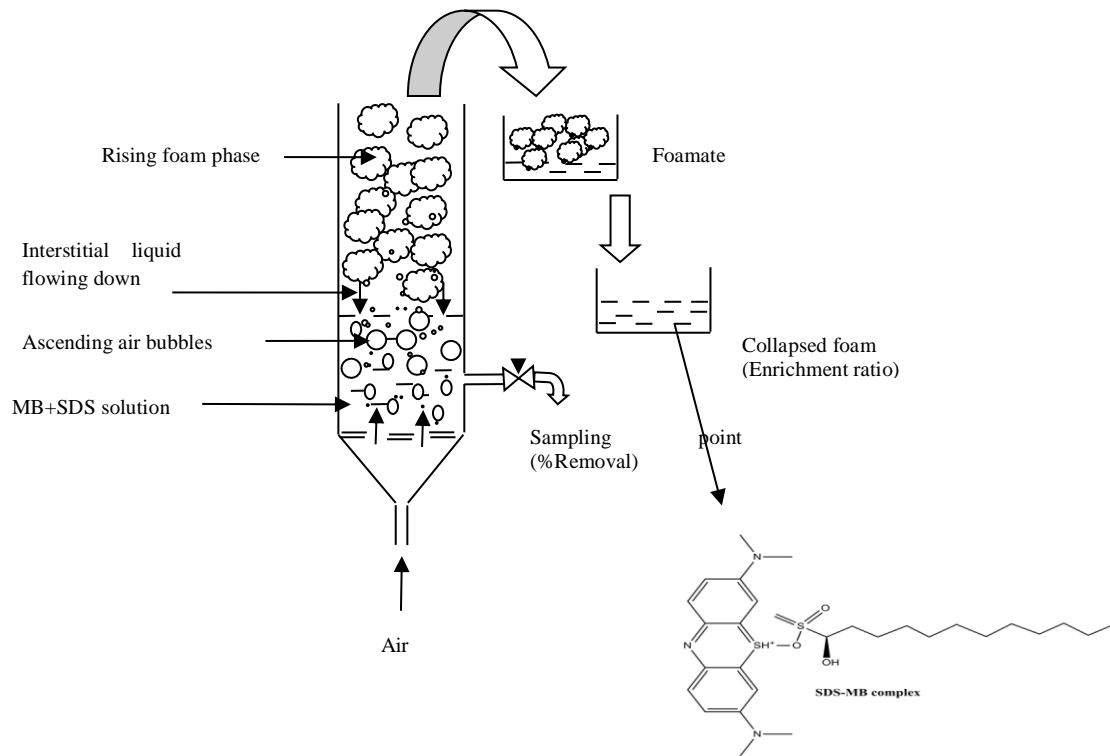


Supplementary Materials

Graphical Abstract



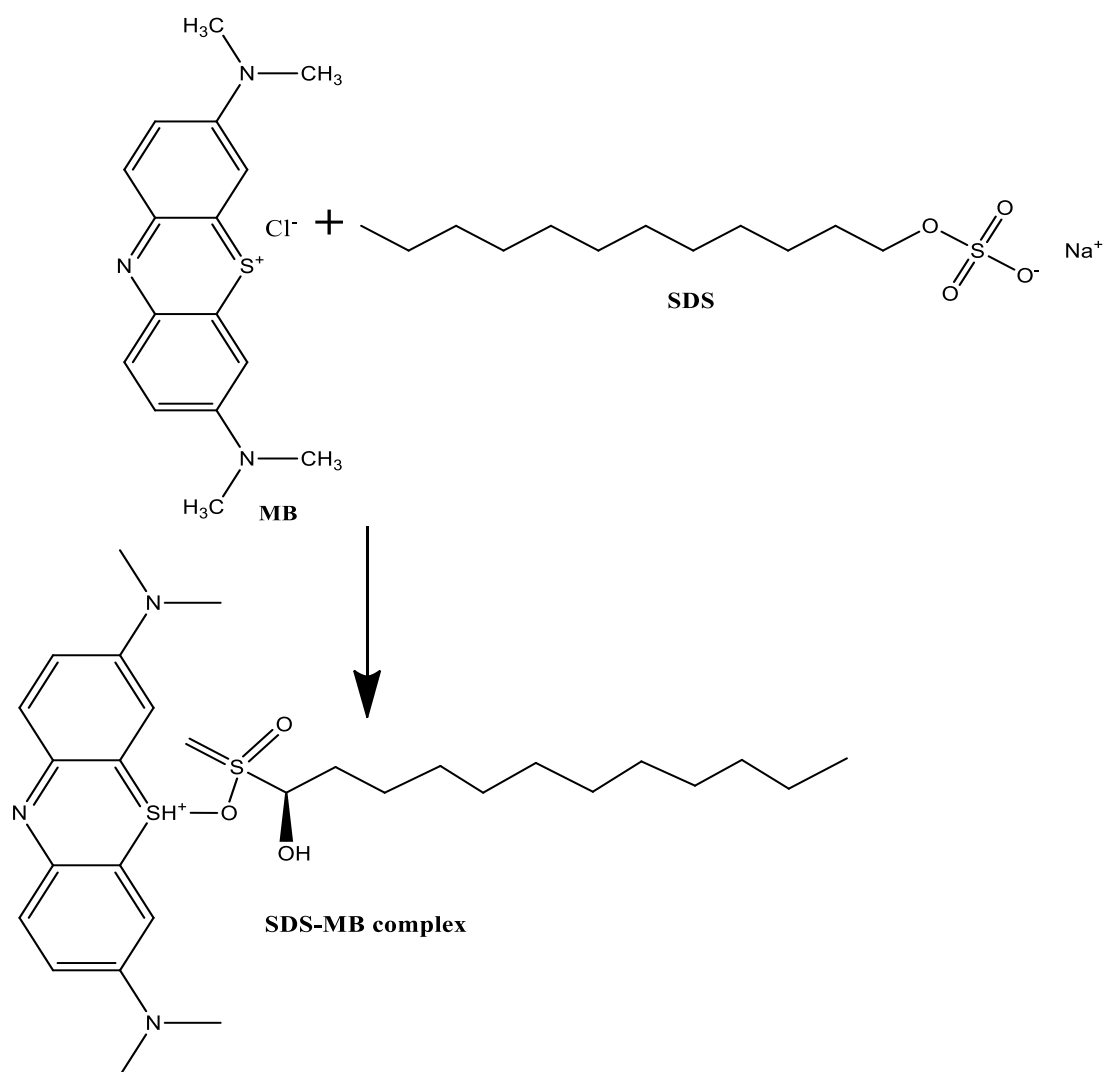


Fig. S1. Chemical reaction showing SDS-MB complex formation.

Table S1. S/N Response Table for Percentage Removal and Enrichment Ratio

Symbol	Operating parameters	Mean S/N ratio (dB)			
		Level 1	Level 2	Level 3	Max-Min
Percentage Removal					
A	Air flow rate	36.46	37.62	*38.83	2.37
B	Liquid loading	*38.86	37.38	36.67	2.19
C	Dye concentration	*39.15	37.93	35.83	3.32
Enrichment Ratio					
A	Air flow rate	*19.14	13.62	7.70	11.44
B	Liquid loading	*14.14	13.26	13.05	1.09
C	Dye concentration	11.46	*16.81	12.19	5.35

*Optimum value

Table S2. Results of the ANOVA for Percentage Removal and Enrichment Ratio

Symbol	Input parameters	Degrees of freedom (<i>f</i>)	Sum of squares (<i>SS</i>)	Variance (<i>V</i>)	F-ratio (<i>F</i>)	PC(%)
Percentage Removal						
A	Air flow rate	2	8.439	4.219	7.46	24.92
B	Liquid loading	2	7.446	3.723	6.582	21.99
C	Dye concentration	2	16.839	8.419	14.885	49.73
Error		2	1.131	0.565		3.34
Total		8	33.856			
Enrichment ratio						
A	Air flow rate	2	196.582	98.291	223.28	78.62
B	Liquid loading	2	1.978	0.989	2.247	0.79
C	Dye concentration	2	50.596	25.298	57.470	20.23
Error		2	0.880	0.440		0.352
Total		8	250.038			

Table S3. Results of the Confirmation Experiment for Percentage Removal and Enrichment Ratio

Percentage Removal		
	Optimal operating variables	
	Prediction	Experiment
Level	<i>A3B1C1</i>	<i>A3B1C1</i>
% Removal	-	96.7
S/N ratio (dB)	39.79	39.70
Enrichment ratio		
Level	<i>A1B1C2</i>	<i>A1B1C2</i>
Enrichment ratio	-	13.95
S/N ratio (dB)	23.12	22.89

Table S4. Response table for the Grey Relational Grade

Symbol	Input parameters	Average grey relational grade			
		Level 1	Level 2	Level 3	Max-Min
A	Air flow rate	*0.624086	0.507806	0.575973	0.116279
B	Liquid loading	*0.621423	0.602631	0.48381	0.137613
C	Dye concentration	*0.650408	0.620633	0.436823	0.213585

*Optimum value

Table S5. Results of ANOVA for Grey Relational Grade

Symbol	Input parameters	Degrees of freedom (<i>f</i>)	Sum of squares (<i>SS</i>)	Variance (<i>V</i>)	F-ratio (<i>F</i>)	PC(%)
A	Air flow rate	2	0.020482	0.010241179	129.6352	15.24
B	Liquid loading	2	0.033409	0.01670449	211.4492	24.86
C	Dye concentration	2	0.080291	0.040145649	508.1728	59.76
Error		2	0.000158	7.887×10^{-5}		0.11
Total		8	0.13434			