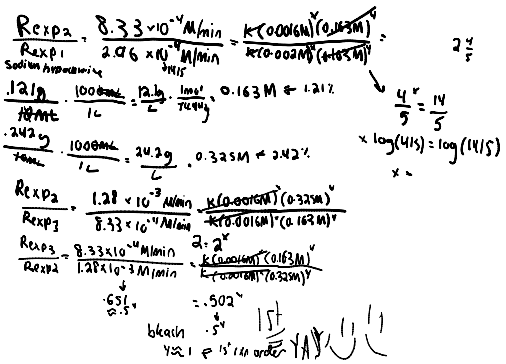
Student Work for Kinetics Lab Investigation: Bleach & Food Dye-Neta & Rayhan

Saturday, October 30, 2021 8:09 PM

0.002M red 40
6.05% by volume

We can vary the conc of the Red #40 dye and the bleach
Set up three experiments as below

Cal with water				
Experiment	Initial Conc of Red #40 Dye (M)	Initial Conc of Bleach (%)	Time (min)	Rate of consumption of Red #40 dye (M/min)
1	0.002M	1.21%	6.75	(-(0-conc of dye stock solution)/(final time-0)) 0.002M/6.75min 2.96*10^-4 M/min
2	0.0016M	1.21%	1.92	0.0016M/1.92min =8.33*10^-4 M/min
3 (good one)	0.0016M	2.42%	1.25	0.0016M/1.25min =1.28*10^-3 M/min



Dye and bleach dilution concentrations have to be experimented with
Conc of dye and bleach stock solution to be known in class

M1V1=M2V2
.002*8=M2*10
M2=.0016M

Bleach (6.05%)	Water	Conc	Test tube
2 mL	8	1.21%	4
4	6	2.42%	3

M1V1 = M2V2
6.05*2=M2*10
M2 = 1.21%
M1V2=M2V2
6.05*4=*10
M2=

Red #40 Dye (0.002 M)	Water	Conc	Test tube
8	2	0.0016M	2
10	0	0.002M	1

1. Create the above dilutions of bleach and dye and calculate according concentrations
2. Standardize colorimeter using a cuvette 3/4 full with bleach and choose wavelength around 500 nm
3. Combine dye with bleach in a cuvette (as shown in first table), begin timer immediately.
   a. 4 to 1 ratio of dye to bleach to avoid a too fast reaction
   b. Add 2 mL dye (used to be 2.4)
   c. Add 1 mL bleach
   d. 4(.2) mL cuvette around
4. Place ASAP into colorimeter, track absorbance vs time.
5. Stop timer when absorbance = less than or equal to 0.005 and find rate of consumption of dye (delta M dye/ delta t)
   a. Delta [dye] = 0 (b/c at end for reaction) - initial M
   b. Delta t = final time - 0 (initial time)
6. Repeat for other 2 experiment recording time (s) each experiment
7. Thus you have initial concentrations and average rate of consumption of dye.
8. Use crossing out math chem stuff to find m and n (x and y) by plugging into differential rate law (Rate = k[dye]^x[bleach]^y)

Observations 2-
1.

Observations 1-
1. Red 40 Dye- misty to thick reddish color liquid
2. Bleach- tinted yellow/light gold liquid
3. For dilutions added DI water then dye/bleach
4. Both concentrations of dye appear relatively the same color almost indistinguishable
5. Cuvette around 4.2ml
6. When bleach added to water the solution began to look oily
7. Test tube 4 contents look more misty than test tube 3
8. Clicked cal to calibrate -add 2 procedure
9. At 0.025 it kept jumping to 0 and back

1. Test tube 1 with 4
2. Test tube 2 with 4
3. Test tube 2 with 3

3 trials each

Experiment 1 conditions rly slow, got stuck around 0.075

Trial 1				
Experiment	Initial Conc of Red #40 Dye (M)	Initial Conc of Bleach (%)	Time (min)	Rate of consumption of Red #40 dye (M/min)
1	0.002M	6.05%	53 s - 0.050 (started going up and down at 0.045) 1 min - 0.080 (stalled)	(-(0-conc of dye stock solution)/(final time-0))
2	0.0016M	6.05%	48 seconds stalled at 0.051	
3	0.0016M	2.42%		
Trial 2				
1	0.002M	2.42%		
2	0.0016M	1.21%		
3	0.0016M	2.42%		
Trial 3				
1	0.002M	2.42%		
2	0.0016M	1.21%		
3	0.0016M	2.42%		

pure bleach, 0.0016M
23s - 0.050
28s - 0.000
23s - 0.050
30s - 0.000
23 - 0.050
30s - 0.00

1. Test tube 1 with 3
2. Test tube 2 with 4
3. Test tube 2 with 3

observe when absorbance stops changing

Observations-
1.