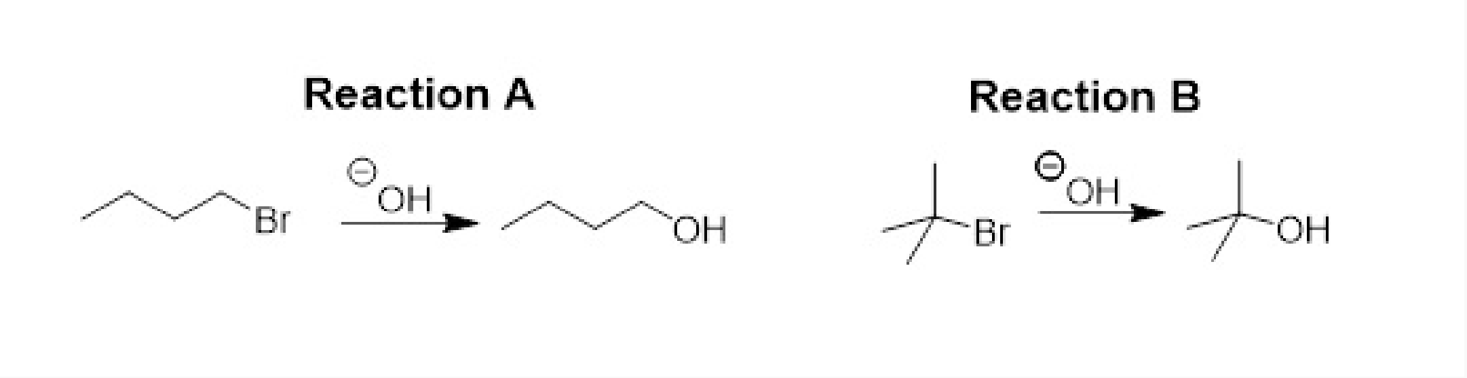
Unit 4 - Week 3

Assignment 3

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-08-21, 23:59 IST.

1) For the given reactions, which statement is correct when the concentration of alkyl bromide is doubled? ***1 point***

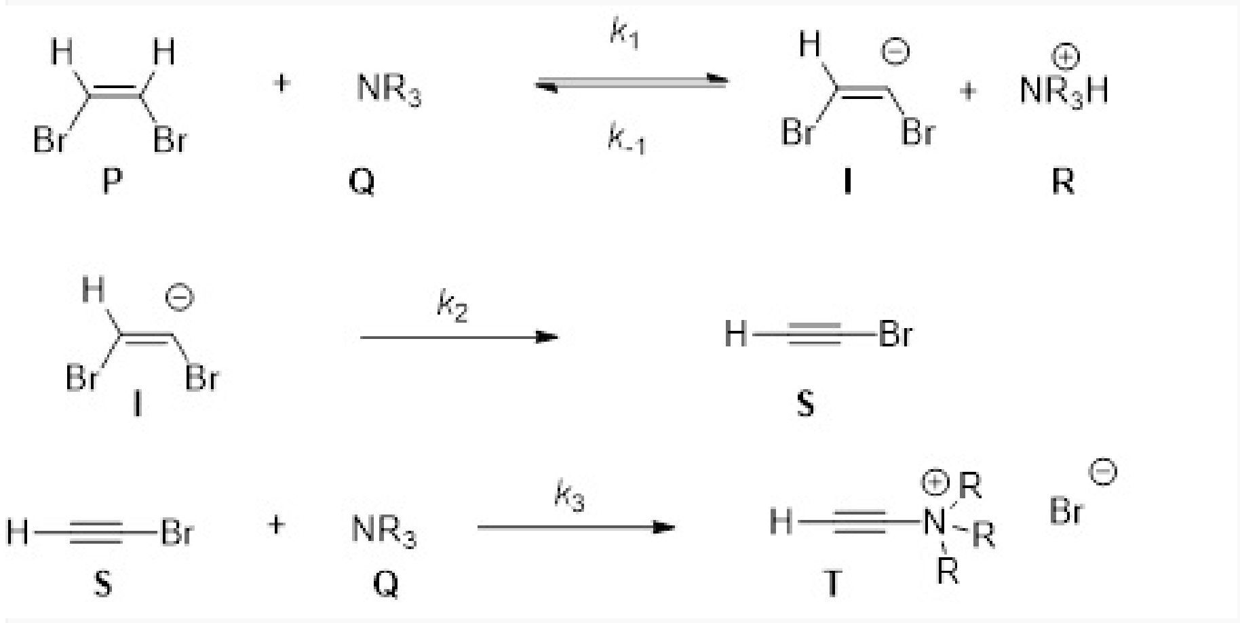


○ Rate is doubled for both reactions
○ Rate is unaffected for both reactions
○ Reaction A: Rate is doubled; Reaction B: Rate is unaffected
○ Reaction A: Rate is unaffected; Reaction B: Rate is doubled

No, the answer is incorrect.
Score: 0

Accepted Answers:
Rate is doubled for both reactions

2) Assuming that the first step is in equilibrium and the second step is the rate determining step, the rate law for the given transformation is given by.: ***1 point***



○ $\text{Rate} = k_2[P][Q]$

○ $\text{Rate} = \dfrac{k_1k_2[P][Q]}{k_{-1}[R] + k_2}$

○ $\text{Rate} = \dfrac{k_1k_2[P][Q]}{k_{-1} + k_2}$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$\text{Rate} = \dfrac{k_1k_2[P][Q]}{k_{-1}[R] + k_2}$

3) For the reaction given by a equation, the rate law is ***1 point***

$$A + B \underset{k_{-1}}{\overset{k_1}{\rightleftharpoons}} I \xrightarrow{k_2} P$$

○ $\text{Rate} = k_2[A][B]$

○ $\text{Rate} = \dfrac{k_1k_2[A][B]}{k_{-1} + k_2[B]}$

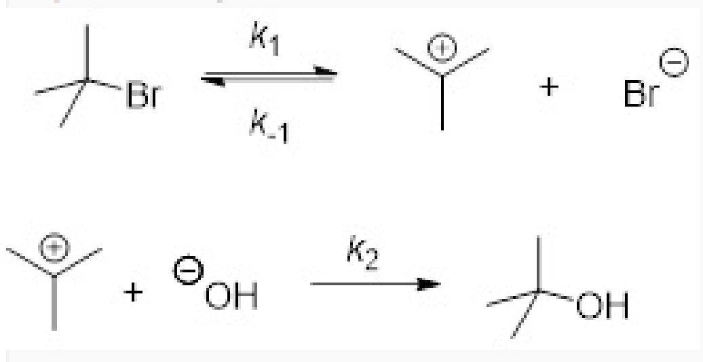
○ $\text{Rate} = \dfrac{k_1k_2[A][B]}{k_{-1} + k_2}$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$\text{Rate} = \dfrac{k_1k_2[A][B]}{k_{-1} + k_2}$

4) The simplified rate law for the SN1 reaction given below is rate = k1[RX] because, ***1 point***



○ k-1 >> k2
○ k2 >> k-1
○ k-1 = k2

No, the answer is incorrect.
Score: 0

Accepted Answers:
k2 >> k-1

5) The correct trend for the equilibrium constant of p-substituted benzoic acid, for the substituents X = OMe, Me, CF3, NO2 and Br is. ***1 point***

○ OMe < Me < Br < CF3 < NO2
○ NO2 < CF3 < Br < Me < OMe
○ OMe < Br < Me < CF3 < NO2
○ NO2 < CF3 < Me < Br < OMe

No, the answer is incorrect.
Score: 0

Accepted Answers:
OMe < Me < Br < CF3 < NO2

6) Which of the following statement is NOT true? ***1 point***

○ The σ_m and σ_p value for a hydroxy substituent (OH) is positive.
○ The σ_m and σ_p value for nitro substituent (NO2) is positive.
○ The σ_m and σ_p for diazo substituent (+N≡N) is positive.
○ The σ_m and σ_p value for chloro substituent (Cl) is positive.

No, the answer is incorrect.
Score: 0

Accepted Answers:
The σ_m and σ_p value for a hydroxy substituent (OH) is positive.

7) Match the reactions of p-substituted aryl compounds (Ar) given in Column D with the Hammett's ρ-values in Column E. ***1 point***

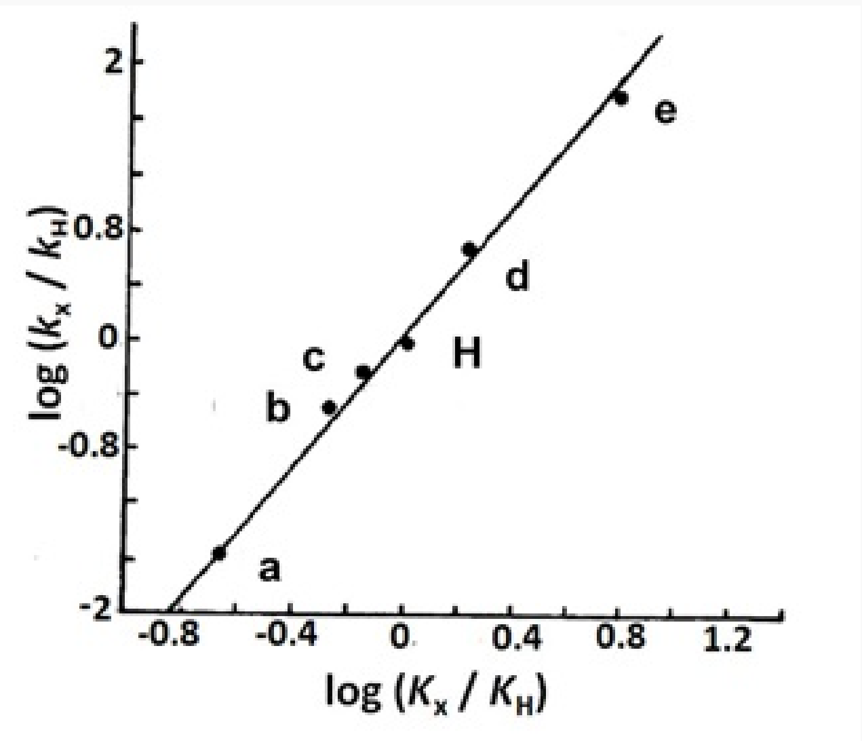
	Column D		**Column E (ρ values)**
(a)	$\text{Ar-COOH} \rightleftharpoons \text{Ar-COO}^{\ominus}$ In water	(i)	+1.57
(b)	$\text{Ar-COOH} \rightleftharpoons \text{Ar-COO}^{\ominus}$ In ethanol	(ii)	+1.0
(c)	$\text{Ar-CH}_2\text{-COOH} \rightleftharpoons \text{Ar-CH}_2\text{-COO}^{\ominus}$	(iii)	+2.26
(d)	$\text{Ar−OH} \rightleftharpoons \text{Ar−O}^{\ominus}$	(iv)	+0.56

○ (a)-(i); (b)-(ii); (c)-(iv); (d)-(iii)
○ (a)-(ii); (b)-(i); (c)-(iv); (d)-(iii)
○ (a)-(ii); (b)-(iii); (c)-(iv); (d)-(i)
○ (a)-(i); (b)-(iv); (c)-(i); (d)-(iii)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(a)-(ii); (b)-(i); (c)-(iv); (d)-(iii)

8) The Hammett plot for the hydrolysis of ethyl benzoate to benzoic acid is given below. Identify the substituents a to e. ***1 point***



○ a = NH2, b = OMe, c = Cl, d = Me, e=NO2
○ a = NH2, b = OMe, c = Me, d = Cl, e=NO2
○ a = NO2, b = Cl, c = Me, d = OMe, e=NH2
○ a = NO2, b = Me, c = Cl, d = OMe, e=NH2

No, the answer is incorrect.
Score: 0

Accepted Answers:
a = NH2, b = OMe, c = Me, d = Cl, e=NO2

9) The Hammett substituent constant σ is based on ***1 point***

○ The dissociation of benzoic acid
○ The dissociate of phenol
○ The hydrolysis of ethyl benzoate.
○ The dissociation of triphenyl methyl chloride.

No, the answer is incorrect.
Score: 0

Accepted Answers:
The dissociation of benzoic acid

10) Given that the pK_as of benzoic acid and p-hydroxy benzoic acid are 4.20 and 4.57, respectively, the σ value for OH is ***1 point***

○ -0.37
○ -1.09
○ -0.92
○ +8.77

No, the answer is incorrect.
Score: 0

Accepted Answers:
-0.37

11) Which of the following substitutents does not have a positive sigma (σ) value at the para position? ***1 point***

○ NO2
○ NMe_3^+
○ I
○ Me

No, the answer is incorrect.
Score: 0

Accepted Answers:
Me