The following data were acquired in an iodination experiment involving acetone.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Trial | Volume of 0.0010 M~\rm I_2 (\rm mL) | Volume of 0.050 M~\rm HCl (\rm mL) | Volume of 1.0 Macetone (\rm mL) | Volume of water (\rm mL) | Temperature (^{\circ} \rm C) | Reaction time (\rm s) |
| A | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 130 |
| B | 10.0 | 10.0 | 10.0 | 20.0 | 25.0 | 249 |
| C | 10.0 | 20.0 | 10.0 | 10.0 | 25.0 | 128 |
| D | 10.0 | 10.0 | 20.0 | 10.0 | 25.0 | 131 |
| E | 10.0 | 10.0 | 10.0 | 20.0 | 42.4 | 38 |

The rate = k [I2]-1[H+]1[CH3COCH3]1

What is the rate constant at 25.0 ^{\circ} \rm Cbased on the data collected for trial B? Assume that the relative rate is equal to the actual rate in molar per second.

This is the information I used.

HCl = 0.05 M

I2 = 0.001 M

Acetone = 1 M

Rate = (based on acetone since highest molarity) 1/249 = 0.004 M -1

So from rate = [Is]-1[HCl]1[Acetone]1

0.004 = k[0.001]-1[0.05]1[1]1

k = 8\*10-5

Also tried .001/249 and it was wrong.

I worked this problem and got 8\*10-5 and was told I was incorrect. The message said –“ You may have used the initial concentrations of the species. Instead, you have to calculate the new concentration after the components are mixed together using M1V1=M2V2.

Please include an explanation.