The Rate of Reaction Between Acetone and Bromine

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- ABSTRACT:

  The rate of reacton between acetone and bromine are studied using a spectrometer. The order of the reaction and the rate constant are determined.

- TEXT REFERENCE:

  Sime, Rodney J., "Physical Chemistry - Methods, Techniques and Experiments," Saunders Pub., Philadelphia, PA, 1990. p. 621-628.

- OTHER REFERENCES:
- GENERAL DESCRIPTION AND THEORY:

  The method of initial rates is used to determine the order and rate constant for the bromination of acetone in acid solution. The rate is followd by using the spectrometer to measure the absorption of bromine as a function of time at a selected wavelength. The absorbancies are related to the concentration by A = abc in dilute solutions. Here a is the molar absorptivity, b the cell thickness and c the concentration. From graphs of the log of the rate versus the concentration for each species, the order with respect to each species can be found. Then the rate constant for each run may be calculated.

- EQUIPMENT:

  Spectrophotometer, cells volumetric glassware.

- CHEMICALS:

  Acetone, bromine solution, HCl.

- LABORATORY PROCEDURE:

  Follow the procedure described by Sime.

- CALCULATIONS:

  The calculations are those described by Sime.

- LITERATURE VALUES:

  Molar Absorptivities of Bromine in aqeous solutions: Wavelength(nm) , a(L/mol cm)

  1. 400 , 160

2. 450 , 100
3. 500 , 30
4. 550 , 8