EXPRIMENT 0

This is an exercise to train you to prepare your own solutions by linking it to the iodine clock oscillating reaction developed by Briggs and Rauscher. An additional objective is to familiarize you with the M. Tech. laboratory where you will do all your physical chemistry experiments.

You are provided malonic acid ($CH_2(COOH)_2$), $MnSO_4 \cdot H_2O$(s), KIO_3(s), concentrated H_2SO_4, 3%(w/v) boiled-starch indicator solution, and 30% H_2O_2 solution.

Procedure

1. Prepare the following solutions.

   Solution 1 50 mL of 0.15 M $CH_2(COOH)_2$ and 0.020 M $MnSO_4$.

   Solution 2 50 mL 0.20 M KIO_3 in 0.080M H_2SO_4.

   Solution 3 25 mL of 3.6 M H_2O_2.

2. Mix equal volumes (10 mL) of solutions 1, 2, and 3 and pour them into a beaker with several drops of starch. If you have prepared the solutions correctly, the mixture will repeatedly display characteristic color changes. The non-appearance of the oscillating color changes is an indication that one or more of the solutions may have been incorrectly prepared.

Observations

1. Show how much solute was required to prepare each of the three solutions.

2. Record the color changes after mixing the three solutions and the times when they happen.

References

1. Wang, M. R. *J. Chem. Educ.* 2000, **77**, 249

2. Briggs T. S.; Rauscher, W. C. *J. Chem. Educ.* 1973, **50**, 496