

Problem 6.1

Problem Purpose

This problem will help you determine whether you have mastered the learning objectives for this unit.

Problem Statement

The formation of phosgene appears macroscopically to take place according to reaction (1) below. It has been suggested that at the molecular level, the actual events taking place are given by reactions (2), (3) and (4). Determine whether this is a chain reaction mechanism, and if it is, classify each of the mechanistic steps as initiation/termination, propagation, chain branching or chain transfer. Then show that there is a linear combination of the mechanistic steps that is equal to the macroscopically observed non-elementary reaction and write an expression for the rate of reaction (1) with respect to Cl_2 , based on the mechanism.

