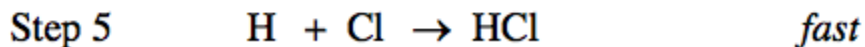
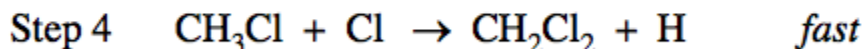
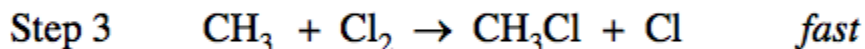
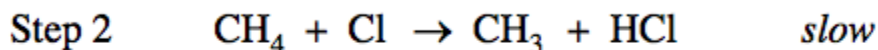
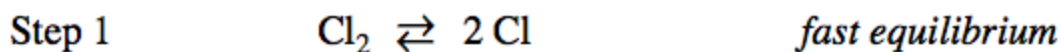


Directions: Read the passage below and answer the question(s) that follow.

APQ 2009-3

Intro

The following mechanism has been proposed for the reaction of methane gas with chlorine gas. All species are in the gas phase.



- 1 In the mechanism, is  $\text{CH}_3\text{Cl}$  a catalyst, or is it an intermediate? Justify your answer.
- 2 Identify the order of the reaction with respect to  $\text{CH}_4$  according to the mechanism. Justify your answer.
- 3 Identify the order of the reaction with respect to  $\text{Cl}_2$  according to the mechanism. Justify your answer.