

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

1) _____ is the study of reaction rates.

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

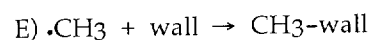
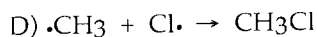
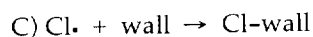
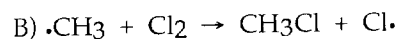
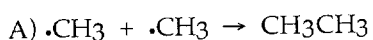
2) Write an equation to describe the initiation step in the chlorination of methane.

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3) Species with unpaired electrons are called _____.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

4) Which of the following is not a possible termination step in the free radical chlorination of methane?



5) For a given reaction, if ΔG° is greater than zero, then:

A) $K_{\text{eq}} = 1$

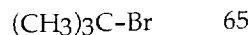
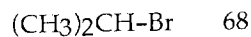
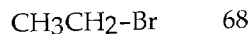
B) $0 < K_{\text{eq}} < 1$

C) $K_{\text{eq}} = 0$

D) $K_{\text{eq}} < 0$

E) $K_{\text{eq}} > 1$

6) Consider the bond dissociation energies listed below in kcal/mol.



These data show that the carbon-bromine bond is weakest when bromine is bound to a _____.

A) primary carbon

B) quaternary carbon

C) tertiary carbon

D) methyl carbon

E) secondary carbon

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

7) The following reaction occurs readily: $\text{CH}_3\text{Br} + \text{I}^- \rightarrow \text{CH}_3\text{I} + \text{Br}^-$.

Experimentally one finds that if the concentration of I^- is doubled, the rate doubles. Also if the concentration of CH_3Br is halved, the rate is halved. What is the rate equation for this reaction?

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8) The difference in energy between reactants and the transition state is known as _____.