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(a) The symbol equation for the reaction can be represented as shown in Fig. 3.1.

Fig. 3.1

Table 3.1 shows some bond energies.

| bond  | kJ/mol | kJ/mol |
|-------|--------|--------|
| C-H   | 413    | 413    |
| C-Cl  | 344    | 344    |
| H-Cl  | 431    | 431    |
| Cl-Cl | 242    | 242    |

Use the bond energies in Table 3.1 and  $\Delta H = -204 \text{ kJ/mol}$  to calculate the bond energy of one C-Cl bond in  $\text{kJ/mol}$ .

Use the following steps.

- Calculate the energy needed to break bonds in the reactants.
 
$$\begin{aligned}
 & (2 \times \text{C-H}) + 1(\text{C-C}) \\
 & 4 \times 413 + 1(344) \\
 & \underline{2150} \text{ kJ/mol}
 \end{aligned}$$
- Calculate the energy released when bonds form in the products.
 
$$\begin{aligned}
 & \text{bond broken} - \text{bond formed} = -90 \\
 & 2150 - x = -90 \\
 & x = 2240 \text{ kJ/mol}
 \end{aligned}$$
- Calculate the energy of one C-Cl bond.
 
$$\begin{aligned}
 & 6 \times (\text{C-H}) = 2478 \\
 & \text{C-Cl} = \frac{2478 - 2240}{6} \\
 & \underline{39} \text{ kJ/mol}
 \end{aligned}$$

# 0620 31 M J 11 Marking Scheme

**Robert R. Redfield**



## 0620 31 M J 11 Marking Scheme:

Mergent International Manual ,2002      *Scientific and Technical Aerospace Reports* ,1989      Smart Intelligent Computing and Applications Suresh Chandra Satapathy,Vikrant Bhateja,Swagatam Das,2018-11-04 The proceedings covers advanced and multi disciplinary research on design of smart computing and informatics The theme of the book broadly focuses on various innovation paradigms in system knowledge intelligence and sustainability that may be applied to provide realistic solution to varied problems in society environment and industries The volume publishes quality work pertaining to the scope of the conference which is extended towards deployment of emerging computational and knowledge transfer approaches optimizing solutions in varied disciplines of science technology and healthcare      **Keywords Index to U.S. Government Technical Reports** United States. Department of Commerce. Office of Technical Services,1962      Keywords Index to U.S. Government Technical Reports (permuted Title Index). United States. Department of Commerce. Office of Technical Services,1962      *Metals Abstracts* ,1996      **Metals Abstracts Index** ,1996      **Reeds Western Almanac 2017** Perrin Towler,Mark Fishwick,2016-10-06 The Reeds Western Almanac covers the coastline from Cape Wrath to Padstow as well as the whole of Ireland and is ideal for any boater lucky enough to cruise and race in the superb waters off the coast of Western Scotland Ireland or Western England It offers ready access to essential navigation information by virtue of its clear layout and user friendly format Completely updated for 2017 topics include seamanship pilotage tide tables safety procedures navigation tips radio lights waypoints weather forecast information communications Mayday and distress procedures The spiral binding allows the Almanac to be opened flat on the chart table and the large type size and clear layout makes information easy to read even in adverse conditions It is the complete guide for both Irish and Scottish mariners as well as those cruising the UK west coast Includes a free Reeds Marina Guide Also available free supplements of up to date navigation changes from January to June at [www.reedsnauticalalmanac.co.uk](http://www.reedsnauticalalmanac.co.uk) There are some things I would not go to sea without Reeds is one of them Sir Chay Blyth      **Reeds Nautical Almanac 2017** Perrin Towler,Mark Fishwick,2016-10-06 Reeds Nautical Almanac is the indispensable trusted annual compendium of navigational data for yachtsmen and motorboaters and provides all the information required to navigate Atlantic coastal waters around the whole of the UK Ireland Channel Islands and the entire European coastline from the tip of Denmark right down to Gibraltar Northern Morocco the Azores and Madeira The 2017 edition continues the Almanac s tradition of year on year improvement and meticulous presentation of all the data required for safe navigation Now with an improved layout for easier reference and with over 45 000 annual changes it is regarded as the bible of almanacs for anyone going to sea The 2017 edition is updated throughout containing over 45 000 changes and includes 700 harbour chartlets tide tables and tidal streams buoyage and lights 7 500 waypoints invaluable passage notes distance tables radio weather and safety information first aid section Also a free Marina Guide Also available free supplements of up to date navigation changes from January to June at

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