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of an internally reversible heat engine when producing maximum power output; 5.2 Efficiency of combined cycle internally reversible heat engines when producing maximum power output; 5.3 Concluding remarks; Problems; Chapter 6. General Thermodynamic Relationships (single component systems, or systems of constant composition); 6.1 The Maxwell relationships; 6.2 Uses of the thermodynamic relationships; 6.3 Tds relationships; 6.4 Relationships between specific heat capacities; 6.5 The Clausius-Clapeyron equation 6.6 Concluding remarksProblems; Chapter 7. Equations of State; 7.1 Ideal gas law; 7.2 Van der Waals' equation of state; 7.3 Law of corresponding states; 7.4 Isotherms or isobars in the two-phase region; 7.5 Concluding remarks; Problems; Chapter 8. Liquefaction of Gases; 8.1 Liquefaction by cooling - method (i); 8.2 Liquefaction by expansion - method (ii); 8.3 The Joule-Thomson effect; 8.4 Linde liquefaction plant; 8.5 Inversion point on p-v-T surface for water; 8.6 Concluding remarks; Problems; Chapter 9. Thermodynamic Properties of Ideal Gases and Ideal Gas Mixtures of Constant Composition 9.1 Molecular weights9.2 State equation for ideal gases; 9.3 Tables of  $u(T)$  and  $h(T)$  against T; 9.4 Mixtures of ideal gases; 9.5 Entropy of mixtures; 9.6 Concluding remarks; Problems; Chapter 10. Thermodynamics of Combustion; 10.1 Simple chemistry; 10.2 Combustion of simple hydrocarbon fuels; 10.3 Heats of formation and heats of reaction; 10.4 Application of the energy equation to the combustion process - a macroscopic approach; 10.5 Combustion processes; 10.6 Examples; 10.7 Concluding remarks; Problems; Chapter 11. Chemistry of Combustion; 11.1 Bond energies and heats of formation 11.2 Energy of formation

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## Sommario/riassunto

Although the basic theories of thermodynamics are adequately covered by a number of existing texts, there is little literature that addresses more advanced topics. In this comprehensive work the author redresses this balance, drawing on his twenty-five years of experience of teaching thermodynamics at undergraduate and postgraduate level, to produce a definitive text to cover thoroughly, advanced syllabuses. The book introduces the basic concepts which apply over the whole range of new technologies, considering: a new approach to cycles, enabling their irreversibility to be taken into a

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