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Absorption Heating Technologies

Efficient Heating, Heat Recovery and Renewable Energy

- Presents various novel absorption heating technologies for efficient and clean heating
- Offers advanced solutions to improve the performance and applicability of the basic air source absorption heat pump
- Provides novel concepts to eliminate the soil thermal imbalance and reduce the number of boreholes compared to conventional ground source heat pumps
- Presents a range of hybrid ground source absorption heat pumps for better applicability, efficiency, and economy
- Discusses in-depth studies on novel absorption working fluids, as well as advances in waste heat and renewable energy utilization

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This book offers a comprehensive introduction to novel absorption heating technologies for improving the energy efficiency of heating systems. The proposed low-temperature heating systems, based on an air source absorption heat pump (ASAHP), significantly increase heating efficiency and reduce pollution emissions. As the performance of ASAHPs deteriorates at lower ambient/driving temperatures, a series of advanced cycles is used to extend their applicability, with the compression-assisted ASAHP being the most outstanding example. The book discusses the generator-absorber-heat-exchange ASAHP as a promising solution to make the best of high driving temperatures, an aspect that can be improved further via compression. Further, it addresses the ground source absorption heat pump (GSAHP), which eliminates the soil thermal imbalance of the conventional ground source electrical heat pump (GSEHP), and also reduces the number of boreholes. Various hybrid GSAHP systems are proposed to further enhance applicability, efficiency, and economy: these include a combined GSAHP and GSEHP system, as well as ASAHP and GSAHP systems that incorporate design optimizations. In closing, the book explores the merits of novel working fluids and highlights recent advances concerning waste heat and renewable energy utilization.

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