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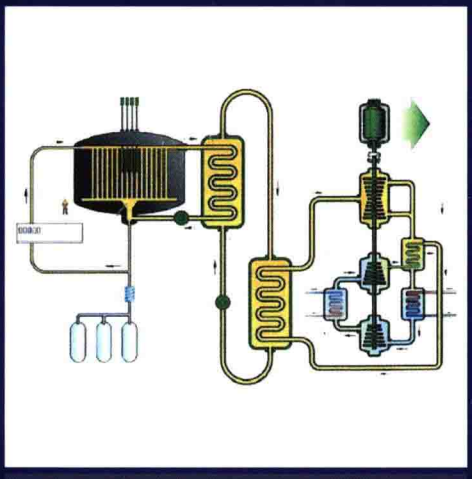

Molten Salt Reactors and Thorium Energy

Edited by Thomas J. Dolan

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Vision

We envision a world where almost every country has affordable molten salt reactors burning thorium, uranium, and spent fuel actinides, producing electricity, hydrogen, and desalinized water with no serious accidents.

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Preface

There is growing awareness that nuclear energy is needed to complement intermittent energy sources and to avoid pollution from fossil fuels. Light-water reactors are complex, expensive, and vulnerable to core melt, steam explosions, and hydrogen explosions, so better technology is needed. Thorium energy and molten salt reactors could make nuclear energy safer and less expensive, so this book describes the current state of the art. It has the following sections:

- Motivation—why are we interested?
- Technical issues—reactor physics, thermal hydraulics, materials, environment, etc.
- Generic designs—thermal, fast, solid fuel, liquid fuel, etc.
- Specific designs—aimed at electrical power, actinide incineration, thorium utilization, etc.
- Worldwide activities in 23 countries.
- Conclusions.

This book is a collaboration of many authors from around the world. It can serve as a reference for engineers and scientists, and it can be used as a textbook for graduate students and advanced undergrads. We hope that leaders of governments and industry will recognize the great potential benefits and provide appropriate research support. Appendix A provides a list of about 450 abbreviations used in this field, since technical readers often suffer from excessive use of abbreviations (EUA). I am grateful to Professor Ritsuo Yoshioka, International Thorium Molten Salt Forum, for guidance in organizing and writing the book.

Thomas J. Dolan

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