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Abstract

This chapter reviews high temperature fuel cell technology. The two main concepts are the Solid Oxide Fuel Cell (SOFC) and the molten carbonate Fuel Cell (MCFC). SOFCs feature a solid oxide electrolyte, and operate in the range 600–1000°C, while MCFCs feature a molten carbonate electrolyte, and operate in the range 500–700°C. Due to their high temperatures, such fuel cells offer different characteristics, applications, requirements and advantages to that of low temperature fuel cells. Key advantages over low temperature fuel cells are the fuel flexibility, offering the possibility to operate with practical fuels, and an improved overall efficiency. After fuel cells principles and characteristics have been introduced, the SOFC technology is reviewed. The history, applications and materials used in SOFCs are presented. An overview of MCFCs is given as well. Finally, a study of fuel cell thermodynamics and efficiency is provided.